

Appendix C

Supplemental Water Supply Information

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C.1 Introduction

This appendix provides supplemental information to Section 3.2, “Water Supply.” The supplemental information includes the regulatory framework for the Central Valley Project (CVP) and State Water Project (SWP) operations within the Delta, as well as background information on CVP and SWP surface water supply conditions. This appendix also describes operational constraints and responsibilities.

Results from the CALSIM II modeling of upstream reservoir operations to evaluate changes expected from the Intertie Proposed Action are summarized in this appendix. Appendix B presents the basic assumptions and water supply results from the CALSIM II modeling of the 2001 No Action and 2020 No Action, as well as the incremental changes that were simulated for the Proposed Action at the 2001 level of development (LOD) (i.e., land use, water demands, and facilities assumptions) and at the 2020 LOD.

The CALSIM II model has been substantially updated with improved modeling assumptions for the Central Valley Project Improvement Act (CVPIA) b(2) and Environmental Water Account programs. Some of the internal assumptions about upstream reservoir carryover targets and San Luis Reservoir storage targets have also been modified. However, the actual year-by-year operations of the CVP and SWP have not changed since this CALSIM II modeling was done in late 2003.

Although the CALSIM II model has been recently modified for the simulations for 2020 Operations Criteria and Plan (OCAP) conditions, the CALSIM II results that are described in Appendix B and summarized in this appendix are adequate for evaluating the incremental effects of the Intertie Proposed Action on CVP and SWP operations. Subsequent environmental impacts from these slightly changed reservoir operations, river flow patterns, and Delta export pumping patterns are accurately evaluated in this document.

C.1.1 Water Supply Regulatory Framework

1978 Water Quality Control Plan and D-1485

In 1978, the State Water Resources Control Board (SWRCB) adopted D-1485 and the Water Quality Control Plan (WQCP) for the Sacramento–San Joaquin Delta and Suisun Marsh (1978 Delta Plan). D-1485 modified the Bureau of Reclamation (Reclamation) and California Department of Water Resources (DWR) permits to require the CVP and the SWP to meet water quality standards specified in the 1978 Delta Plan. The general goal of Decision-1485 (D-1485) standards was to protect Delta resources by maintaining them under conditions that would have occurred in the absence of CVP and SWP operations. D-1485 also required extensive monitoring and special studies of Delta aquatic resources. The CVP and SWP operations under D-1485 are used as the baseline for evaluation and allocation of the CVPIA b(2) water dedicated to fish and wildlife enhancement.

Endangered Fish Species and Operations Criteria and Plan

The federal Endangered Species Act (ESA) requires assessment of the effect of water project operations on fish species listed under the ESA as threatened or endangered. Reclamation issued a summary description of its planned operations for the CVP and SWP in the 1991 OCAP. The National Oceanic and Atmospheric Administration, National Marine Fisheries Service (NOAA Fisheries) issued its biological opinion on the effects of SWP and CVP operations on winter-run Chinook salmon in February 1993, and U.S. Fish and Wildlife Service (USFWS) issued a biological opinion on effects of SWP and CVP operations on delta smelt and splittail in March 1995. The biological opinions establish requirements to be met by the SWP and the CVP to protect these listed species. These include requirements for Delta inflow, Delta outflow, Delta Cross Channel (DCC) gate closure, and reduced export pumping to meet specified incidental “take” limits. These fish-protection requirements impose substantial constraints on Delta water supply operations and have been incorporated in the 1995 WQCP.

1995 Water Quality Control Plan and D-1641

SWRCB's 1995 WQCP (adopted May 1995) and Draft Environmental Impact Report (EIR) for implementation (November 1997) incorporated several elements of the U.S. Environmental Protection Agency (EPA), NOAA Fisheries, and USFWS regulatory objectives for salinity and endangered species protection. The changes from D-1485 regulatory limits for CVP and SWP Delta operations are substantial. SWRCB implemented the 1995 WQCP with decision D-1641 in 2000. The new provisions for X2 (i.e., the position of the 2 parts per thousand

[ppt] salinity gradient), export/inflow (E/I) ratio, and the Vernalis Adaptive Management Program (VAMP) that are implemented in D-1641 are described in the section on Delta water operations because these are the basis for the baseline 2001 and 2020 operations assumed in CALSIM II .

C.1.2 Central Valley Project and State Water Project Surface Water Supply

Trinity River Division

The CVP Trinity River Division, completed in 1964, includes facilities to store and regulate water in the Trinity River and facilities to transfer water to the Sacramento River basin. Trinity Reservoir (formerly called Trinity Reservoir) (formed by Trinity Dam) has a maximum storage capacity of approximately 2.4 million acre-feet (maf). All releases from Trinity Dam are re-regulated downstream at Lewiston Lake to meet downstream flow requirements, and supply exports through Clear Creek tunnel and the Carr power plant to Whiskeytown Lake. Spring Creek tunnel and power plant convey the exported water to Keswick Dam, located on the Sacramento River below Shasta Dam. The mean annual flow into Trinity Reservoir is approximately 1.2 maf, and the instream flow requirements range from about 350 taf to 800 taf, depending on the Trinity runoff volume. There is some flood storage space reserved in the winter months, and the minimum storage in Trinity Reservoir is generally maintained above 1,000 taf for recreation and water temperature considerations.

Table C-1 gives the monthly storage patterns in Trinity Reservoir for the 2001 baseline CALSIM II simulation of the 1922–1994 period of historical inflows. The change in carryover storage simulated for the 2020 baseline is given in the right-hand column. The simulation of Clair Engle storage is relatively similar for the 2001 and 2020 No Action conditions. The reservoir is normally filled to the highest storage level in April–June, and then is drawn down slightly by the end of September. However, only in the drought year sequences was the simulated carryover storage less than 1,000 taf.

Figure C-1 shows the annual sequence of carryover storage in Trinity Reservoir for the 2001 and 2020 baseline simulations. The absolute minimum storage simulated was 250 taf in a few years. Several other years have storage of about 500 taf. The normal seasonal drawdown of Trinity Reservoir is moderate, with a carryover storage of between 1,000 taf and 2,000 taf.

Table C-2 gives the monthly CALSIM II –simulated exports from the Trinity River to the Sacramento River. The 2001 baseline exports average about 540 taf/year, with a range of about 125 taf/year to about 1,160 taf/year. The months of highest export are June–October, corresponding to the highest demands (and prices) for the hydroelectric energy produced by these exports through Carr and Spring Creek power plants. Because the Trinity River flow requirements for the Trinity River Restoration Program (ranging from 369 TAF/year to 815 taf/year)

are the same in both the 2001 and 2020 baseline simulations, there are only small changes in the average Trinity exports, and the changes in any year from 2001 to 2020 No Action were generally less than a 10% difference.

Lake Shasta

Runoff from the upper Sacramento River and tributaries are regulated by the CVP Shasta Dam and re-regulated approximately 15 miles downstream at Keswick Dam. The watershed above Shasta Dam drains approximately 6,650 square miles and produces an average annual inflow of about 6 maf. Inflows generally increase from November through March with peak flows generally occurring in March. As snowmelt is not the dominant component of Shasta inflows, runoff generally decreases in April and May, and inflow is less than 5,000 cfs from June through October.

Table C-3 gives the CALSIM II –simulated Shasta storage for 1922–1994 under the 2001 baseline conditions. Maximum Lake Shasta storage occurs in April–June. A considerable portion of the maximum storage of about 4.5 maf is reserved for flood control space between November and March. Storage usually increases from January through April and decreases from June through October. The changes in carryover storage simulated for the 2020 No Action conditions are shown in the right-hand column. The yearly changes were always less than 5% of the 2001 carryover storage.

Figure C-2 shows the Shasta carryover storage is generally held above 2.0 maf for water temperature control purposes but is simulated to be less than 2.0 maf in about 10% of the years, as allowed under the winter run biological opinion. The simulated carryover storage of less than 1.5 maf in about eight of the years may not be allowed by the fisheries agencies because the water temperature impacts of this drawdown might not be acceptable. The carryover storage is held between 2,500 taf and 3,500 taf in more than half of the years. The 2020 baseline conditions are simulated by CALSIM II to be very similar to these under 2001 conditions.

Table C-4 gives the monthly Keswick Dam release flows simulated by CALSIM II for the 2001 baseline conditions. The Keswick flows are generally regulated by the minimum fish flows and the downstream water supply demands of CVP contractors along the Sacramento River and south of the Delta. The Keswick flows represent the full regulated CVP water supply from Shasta and Trinity, as well as some spills from Shasta. The annual releases range from less than 4.0 maf in 5 years to more than 10 maf in 4 years. Table C-4 indicates that the changes in the simulated 2020 No Action releases were usually less than 5%, and the overall average Keswick release was only 11 taf/yr more.

Lake Oroville

Lake Oroville was completed in 1968 and is the major SWP storage reservoir, with a maximum capacity of about 3.5 maf. However, the Hyatt Power Plant outlets (i.e., selective withdrawal for temperature control) are located at an elevation that provides a minimum storage volume of about 1.0 maf. The effective seasonal and year-to-year drawdown is therefore limited to 2.5 maf. PG&E operates Lake Almanor upstream on the North Fork Feather River. Lake Almanor has a maximum storage of about 1 maf, and is usually operated with a minimum volume of 500 taf, so that it provides a maximum of 500 taf of seasonal storage. The average annual inflow to Lake Oroville is about 4.0 maf and is a combination of rainfall runoff and snowmelt. Monthly flows are greater than 2,000 cfs (80% exceedance) from January through June. Summer flows are well sustained at above 1,000 cfs (80% exceedance) because of snowmelt and springs from the high-elevation watershed. Releases from Oroville flow into the Thermalito Reservoir complex, which provides a storage facility (i.e., afterbay) to allow pumped-storage operations at the Hyatt Power Plant and diversions to supply the 800 taf of water rights held by Feather River water districts. A release of 600 cfs is made to the river to provide spawning and attracting flows for the Feather River hatchery.

Table C-5 gives the CALSIM II –simulated Oroville storage for 1922–1994 under the 2001 Baseline conditions. Maximum Lake Oroville storage occurs in April–June. About 700 taf of the maximum storage is reserved for flood control space between December and March. Storage usually increases from January through April and decreases from June through October. The changes in Oroville carryover storage simulated for the 2020 No Action conditions are shown in the right-hand column. The yearly changes were sometimes more than 10%, but the average carryover storage was very similar (1% less). Figure C-3 shows the Oroville Lake carryover storage simulated by CALSIM II for the 2001 baseline conditions for the 1922–1994 hydrology. The carryover storage is highly variable, from a low carryover storage of about 1 maf (except 1977 with a simulated carryover storage of less than 500 taf) to a maximum carryover storage of more than 3.0 maf in about 20% of the years.

Table C-6 gives the monthly Feather River flow releases below Thermalito Afterbay Reservoir for the 2001 baseline simulations. The Feather River flows below Thermalito are generally regulated by the minimum fish flows (of about 1,000 cfs) and the downstream water supply demands of SWP for Delta export pumping. The summer flows average 3,000 cfs in June–August, and the average September flow is less than 2,000 cfs. Flows vary with runoff conditions, and the average annual release flow is about 3.0 maf, with a minimum flow of 1.0 maf in several dry years and a maximum release volume of 8.0 maf in 1983. Table C-6 indicates that the changes in the simulated 2020 No Action Thermalito releases were usually less than 10%, and the overall average release was only 1 taf/yr more.

Folsom Lake

Folsom Lake was constructed by the U.S. Army Corps of Engineers for the Bureau of Reclamation between 1948 and 1956 as part of the CVP. Folsom Dam impounds a maximum of about 1 maf and is a multipurpose reservoir that provides flood control and seasonal water storage for recreation, power, water supply, and minimum fish protection flows in the American River and to the Delta. Several major reservoirs upstream in the Sierra Nevada have been constructed by other agencies with a total storage of another 1 maf that provide additional flood control and seasonal storage and power benefits. Nimbus Dam, located 7 miles downstream, provides re-regulation of the Folsom releases and diversion to the Folsom South Canal. Total diversions from the American River are estimated in the CALSIM II model to be about 400 taf.

Table C-7 gives the CALSIM II –simulated Folsom storage for 1922–1994 under the 2001 Baseline conditions. Maximum Folsom Lake storage of 975 taf usually occurs in May–June. About 400 taf of the maximum storage is reserved for flood control space between December and March. Storage usually increases from January through May and decreases from July through November. The changes in Folsom carryover storage simulated for the 2020 No Action conditions are shown in the right-hand column. The yearly changes were more than 10% in about a third of the years, and the average carryover storage was 30 taf less for the 2020 No Action conditions.

Figure C-4 shows the Folsom Lake carryover storage at the end of September. The reservoir storage is always less than 650 taf in preparation for rainfall flood control storage reservation in November–March. Storage is above 600 taf in about 40% of the years. Storage is less than 200 taf in the driest 10% of the years. There was some difference in the drawdown for the 2020 baseline conditions because of the higher demands from Folsom simulated as part of the Sacramento Water Forum projections.

Table C-8 gives the Nimbus Dam releases. The average Nimbus release is about 2,500 taf/yr, with a wide range from less than 1, maf in dry years (only 500 taf in 1977) to more than maf in some wet years (15% of years). The water supply diversions from Folsom and Folsom South Canal are increased in the 2020 baseline simulation. The right-hand column of Table 3.1-8 gives the reduction in Nimbus releases resulting from these increased water supply diversions. The average reduction in Nimbus release for the 2020 baseline was 156 taf/year (6% less).

New Melones Reservoir

Table C-9 gives the New Melones storage values simulated for the 2001 baseline. Operation of New Melones is governed by the interim operations plan and includes higher releases for anadromous fish in April and May as part of the CVPIA b(2) water management program. Maximum storage of about 2,500 taf is

achieved only in a few sequences of relatively wet years. New Melones Reservoir supplies irrigation diversion of about 600 taf/year and provides considerable year-to-year storage protection for these water right holders. New Melones usually reaches seasonal maximum storage in June or July from snowmelt. The changes in New Melones carryover storage simulated for the 2020 No Action conditions are shown in the right-hand column. The yearly changes were very small (less than 5 taf), and the average carryover storage was identical for the 2020 No Action conditions. Figure C-5 shows the New Melones Reservoir carryover storage simulated as the 2001 baseline conditions by CALSIM II for the 1922–1994 hydrology. The carryover storage is highly variable, dependent on the sequence of hydrology. Storage is above 2 maf in about 10% of the years. Storage normally declines in subsequent years and may drop below 1 maf in drought sequences. The storage was simulated to drop to about 500 taf in the 1931–1934 drought sequence and the 1990–1992 sequence. The 2020 baseline simulation is nearly identical. The CALSIM II model does not indicate many changes in the San Joaquin River Basin between the 2001 and 2020 baseline assumptions.

The CVP release flows downstream of the irrigation diversions for South San Joaquin and Oakdale Irrigation Districts provide required minimum fisheries flows, provide additional flushing flows during the spring period of Chinook salmon outmigration (i.e., during April and May; included as part of the B[2] water allocation), and help control salinity on the San Joaquin River at Vernalis. The average release is about 625 taf/year, but ranges from only about 300 taf/year in dry years to more than 1 maf/year in a few wet years (as a result of reservoir flood control spills).

Delta Inflows

On average, about 21 maf of water reaches the Delta annually, but monthly average inflows vary widely from year to year and within each year. Delta inflow in water year 1977 totaled only 6 maf, while inflow for water year 1983 was about 70 maf. The average monthly natural runoff to the Delta is lowest in the summer and fall months. The operation of the upstream water supply reservoirs has increased the natural summer and fall flows into the Delta.

Table C-10 gives the CALSIM II –simulated monthly Sacramento River flows at Freeport for the 2001 baseline conditions for the 1922–1994 hydrology with existing reservoirs and regulatory limits. The annual inflow at Freeport ranges from less than 7 maf to more than 35 maf. Very high flows bypass the Sacramento River channel at Freeport and enter the Delta through the Yolo Bypass. The simulated 2020 Delta inflows at Freeport are nearly identical. The changes for the 2020 annual inflows are shown in the right-hand column. The annual changes were almost always less than 2%, and the overall change was a reduction of 1% from the 2001 No Action conditions.

Table C-11 gives the CALSIM II –simulated monthly San Joaquin River flows at Vernalis for the 2001 baseline conditions for the 1922–1994 hydrology. Because

there are major water supply reservoirs and substantial irrigation diversions on the upper San Joaquin River (Friant Dam), on the Tuolumne River (New Don Pedro Dam), and on the Merced River (New Exchequer Dam), the San Joaquin River flow at Vernalis is generally regulated to minimum required flows during the summer and fall period. The changes for the 2020 simulated Delta inflows at Vernalis are shown in the right-hand column. The simulated 2020 No Action annual flows at Vernalis are almost always less than 5% different from the 2001 annual flows, and the overall change was a reduction of 60 taf/yr (2%).

San Luis Reservoir

San Luis Dam and Reservoir are located near Los Banos. The reservoir, with a capacity of about 2.0 maf, is a pumped-storage reservoir used primarily to provide seasonal storage for both CVP and SWP water exported from the Delta. The CVP share of the San Luis Reservoir storage is 972 taf. The SWP share of the San Luis Reservoir storage is 1,067 taf.

O'Neill Dam and Forebay are located downstream of San Luis Dam along the CA. The forebay is used as a hydraulic junction point for state and federal waters. The O'Neill Pumping-Generating Plant lifts CVP water from the DMC to the O'Neill Forebay. The joint CVP/SWP William R. Giannelli Pumping-Generating Plant lifts CVP/SWP water from O'Neill Forebay to San Luis Reservoir. The forebay provides re-regulation storage necessary to permit off-peak pumping and on-peak power generation by the Giannelli plant. When CVP water is released from O'Neill Forebay to the DMC, the units at the O'Neill Pumping-Generating Plant operate as hydroelectric generators.

The San Luis Canal, the joint federal and state (CVP/SWP) portion of the CA, conveys water southeasterly from O'Neill Forebay along the west side of the San Joaquin Valley for delivery to CVP and SWP contractors. The Coalinga Canal conveys water from the San Luis Canal to the Coalinga area, where it serves the southern San Joaquin River Region. The CA continues south to the Edmonston Pumping Plant and over the Tehachapi mountains to MWD and other SWP contractors.

Table C-12 gives the CALSIM II –simulated CVP San Luis storage for 1922–1994 under the 2001 Baseline conditions. Maximum CVP San Luis storage usually occurs in January to March. The maximum CVP San Luis storage is greater than 900 taf in about half of the years. Reduced CVP pumping during the VAMP period in April and May generally requires CVP San Luis Storage to be released for water supply contractors. Storage usually reaches a minimum in August or September. The average simulated carryover storage was 280 taf for the 2001 No Action conditions. The changes in CVP San Luis carryover storage simulated for the 2020 No Action conditions are shown in the right-hand column. The yearly changes were more than 10% in about half of the years, but the average carryover storage was just 5 taf less for the 2020 No Action conditions.

Table C-13 gives the CALSIM II –simulated SWP San Luis storage for 1922–1994 under the 2001 Baseline conditions. Maximum SWP San Luis storage usually occurs in January to March. The maximum SWP San Luis storage is greater than 900 taf in about half of the years. Reduced SWP pumping during the VAMP period in April and May generally requires SWP San Luis Storage to be released for water supply contractors. Storage usually reaches a minimum in August or September. The average simulated carryover storage was 295 taf for the 2001 No Action conditions. The changes in SWP San Luis carryover storage simulated for the 2020 No Action conditions are shown in the right-hand column. The yearly changes were more than 100 taf about half of the years, but the average carryover storage was just 15 taf less for the 2020 No Action conditions.

C.1.3 Central Valley Project and State Water Project Delta Pumping Regulatory Limits

The limits on SWP Banks and CVP Tracy pumping are important to understanding Delta water management because these regulatory limits collectively restrict supply of full CVP and SWP demands for Delta exports. These regulatory limits may result from Delta outflow requirements, export/inflow limits, and permitted or physical export pumping capacity. The Intertie will not change any of these regulatory limits and will therefore not change the protections provided for water quality and fisheries in the Delta.

Delta Outflow Requirements

The minimum monthly Delta outflow objectives protect the salinity range for the estuarine aquatic habitat, and are included in D-1641. The monthly minimum depends on the water year type, which is calculated as the Sacramento Four-River Index from the unimpaired runoff of the Sacramento, Feather, Yuba, and American Rivers. The monthly outflows from February to June are calculated on a daily basis to satisfy the X2 objective. Minimum monthly flows for July range from 4,000 cfs in critical years to 8,000 cfs in wet years. The August outflows range from 3,000 cfs in dry years to 4,000 cfs in below normal years and wetter year types. The September minimum outflow is 3,000 cfs in all year types. The October minimum outflows are 3,000 in critical and 4,000 cfs in all other year types. The November and December required outflows are 3,500 cfs in critical and 4,500 cfs in all other year types.

Although these D-1641 outflow objectives specify the minimum outflows during these months, a water supply and water quality tradeoff is involved in the actual operation of the Delta. A slightly higher outflow will reduce the salinity intrusion of Suisun Bay water into the Central Delta and reduce the salinity (i.e., electrical conductivity [EC], chloride, bromide) of the CVP and SWP exports. The CVP and SWP operations may sometimes reduce pumping during these fall months to reduce the salinity of the exports, even though this will also reduce the water supply volume pumped during these months.

X2 Objective

The location of the estuarine salinity gradient is regulated during the months of February–June by the X2 (i.e., the position of the 2 parts per thousand [ppt] salinity gradient) objective in the 1995 WQCP (D-1641). The X2 position must remain downstream of Collinsville (kilometer 91 upstream from the Golden Gate Bridge) for the entire 5-month period. This requires a minimum outflow of about 7,100 cfs. The X2 objective specifies the number of days each month when the location of X2 must be downstream of Chipps Island (kilometer 75) or downstream of the Port Chicago EC monitoring station (kilometer 64). The number of days depends on the previous month runoff index value. Maintaining X2 at Chipps Island requires a Delta outflow of about 11,400 cfs and maintaining X2 at Port Chicago requires a Delta outflow of about 29,200 cfs. Meeting the X2 objectives can require a relatively large volume of water for outflow during dry months that follow months with large storms.

Maximum Export/Inflow Ratios

D-1641 includes a maximum export/inflow (E/I) ratio objective to limit the fraction of Delta inflows that are exported. This objective was developed to protect fish species and to reduce entrainment losses. Delta exports are considered to be the CVP Tracy and SWP Banks pumping plants. Delta inflows are the gaged river inflows (does not include rainfall runoff in the Delta). The maximum E/I ratio is 0.35 for February through June and 0.65 for the remainder of the year. If the January runoff index is relatively low, the February E/I ratio is increased to 0.45. CVP and SWP have agreed to share the allowable exports if the E/I ratio is limiting as less than twice the CVP Tracy capacity.

Delta Cross Channel Operations

Reclamation operates the DCC to improve the transfer of water from the Sacramento River to the export facilities at the Tracy pumping plant, and to improve water quality in the south Delta by reducing saltwater intrusion from Antioch. The gates, however, are closed whenever flows in the Sacramento River at Freeport reach about 25,000 cfs, to reduce scour on the downstream side of the gates and to reduce potential flooding on the Mokelumne River channels.

The SWRCB D-1641 provides for closure of the DCC gates from February 1 through May 20 for fish protection. From November through January, the DCC may be closed for up to an additional 45 days. The gates may also be closed for 14 days during the period of May 21 through June 15. Reclamation shall determine the timing and duration of the closures after consultation with USFWS, DFG, and NOAA Fisheries. Monitoring for fish presence and movement in the Sacramento River and Delta, the salvage of salmon at the Tracy and Skinner facilities, and hydrologic “cues” (i.e. storm events) are used to determine the timing of DCC closures, subject to water quality conditions.

CVPIA Water Management in the Delta

The CVP Tracy pumping is regulated by the D-1641 water quality and fish protection objectives. In addition, the USFWS manages the 800 taf/yr of CVP water supply for anadromous fish enhancement and wildlife purposes. A portion of this water is designated to reduce CVP Tracy pumping during periods of high risk to the anadromous species. The VAMP period of April 15- May 15 is one of the designated periods of protection. Because the D-1485 conditions are considered the baseline for the b(2) water accounting, the 3,000 cfs CVP Tracy pumping limit (that originally was replaced with wheeling by SWP pumping) is often maintained as part of the b(2) allocation. Additional reduction of CVP pumping to 750 cfs is usually requested during the VAMP period and sometimes extending into May and June if fish densities at the salvage facilities remain high and water remains in the CVPIA b(2) water account. The Intertie action will allow some additional portion of the CVP demands to be pumped at the Tracy facility without relying on SWP wheeling at the Banks pumping plant.

Environmental Water Account Operations

The EWA, as described in the Final EIS/EIR, is a cooperative management program with the purpose of providing protection to at-risk fish species of the Bay-Delta estuary through environmentally beneficial changes in SWP and CVP operations at no uncompensated water cost to the Projects' users. This approach to fish protection involves changing Project operations to benefit fish and the acquisition of alternative sources of project water supply, called the "EWA assets," which the EWA agencies use to replace the regular Project water supply lost by pumping reductions (EWA Draft EIS/EIR July 2003).

The EWA program consists of two primary elements: implementing fish actions that protect species of concern and increasing water supply reliability by acquiring and management assets to compensate for the effects of these actions. Actions that protect fish species include reduction of pumping at the SWP and CVP export pumping plants in the Delta. Pumping reductions can reduce water supply reliability for the SWP and CVP export service area, causing conflicts between fishery and water supply interests. A key feature of the EWA is use of water assets to replace supplies that are interrupted during pumping reductions. The EWA assets can also provide other benefits such as augmenting instream flows and Delta outflows (EWA Draft EIS/EIR July 2003).

The EWA implementation is assumed in the CALSIM II modeling of the Intertie Proposed Action. The EWA actions have generally been used to reduce SWP pumping at Banks because the CVPIA b(2) water management actions have been used to restrict CVP Tracy Pumping in the April–June period of highest fish density.

Figure C-1. Annual Carryover Storage (taf) in Trinity for the 2001 and 2020 No Action Simulations

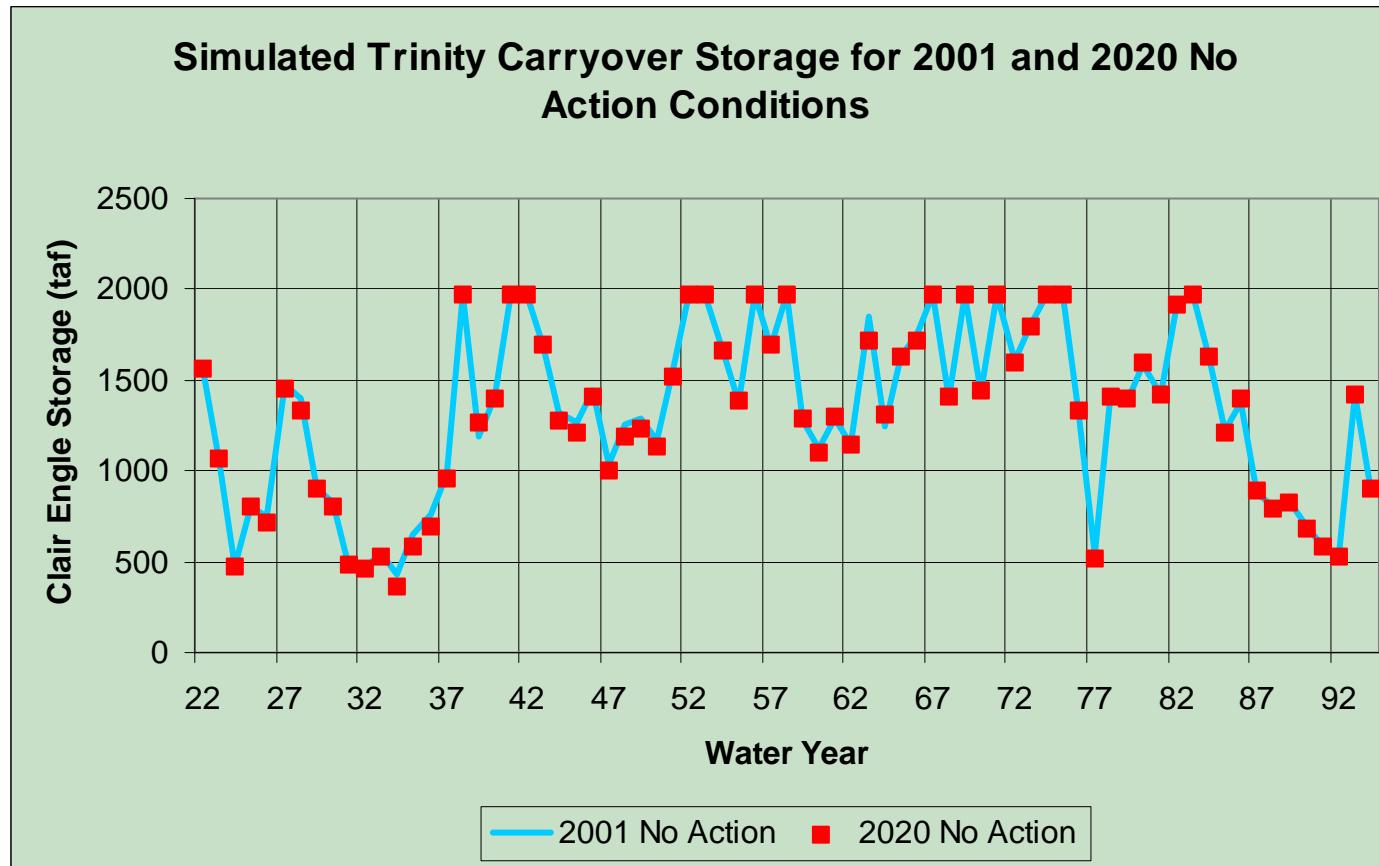


Figure C-2. Annual Carryover Storage (taf) in Shasta for the 2001 and 2020 No Action Simulations

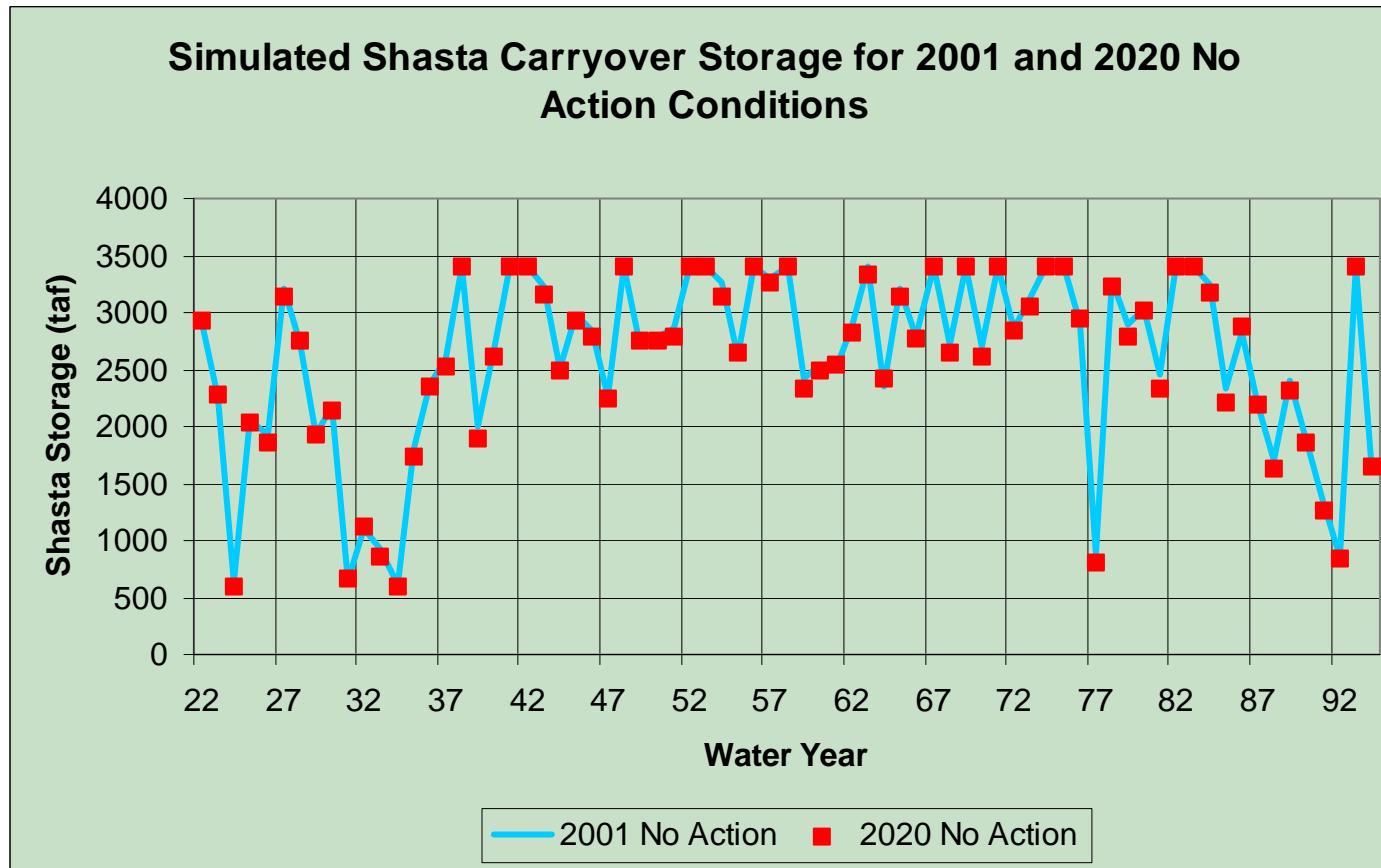


Figure C-3. Annual Carryover Storage (taf) at Oroville Lake for the 2001 and 2020 No Action Simulation

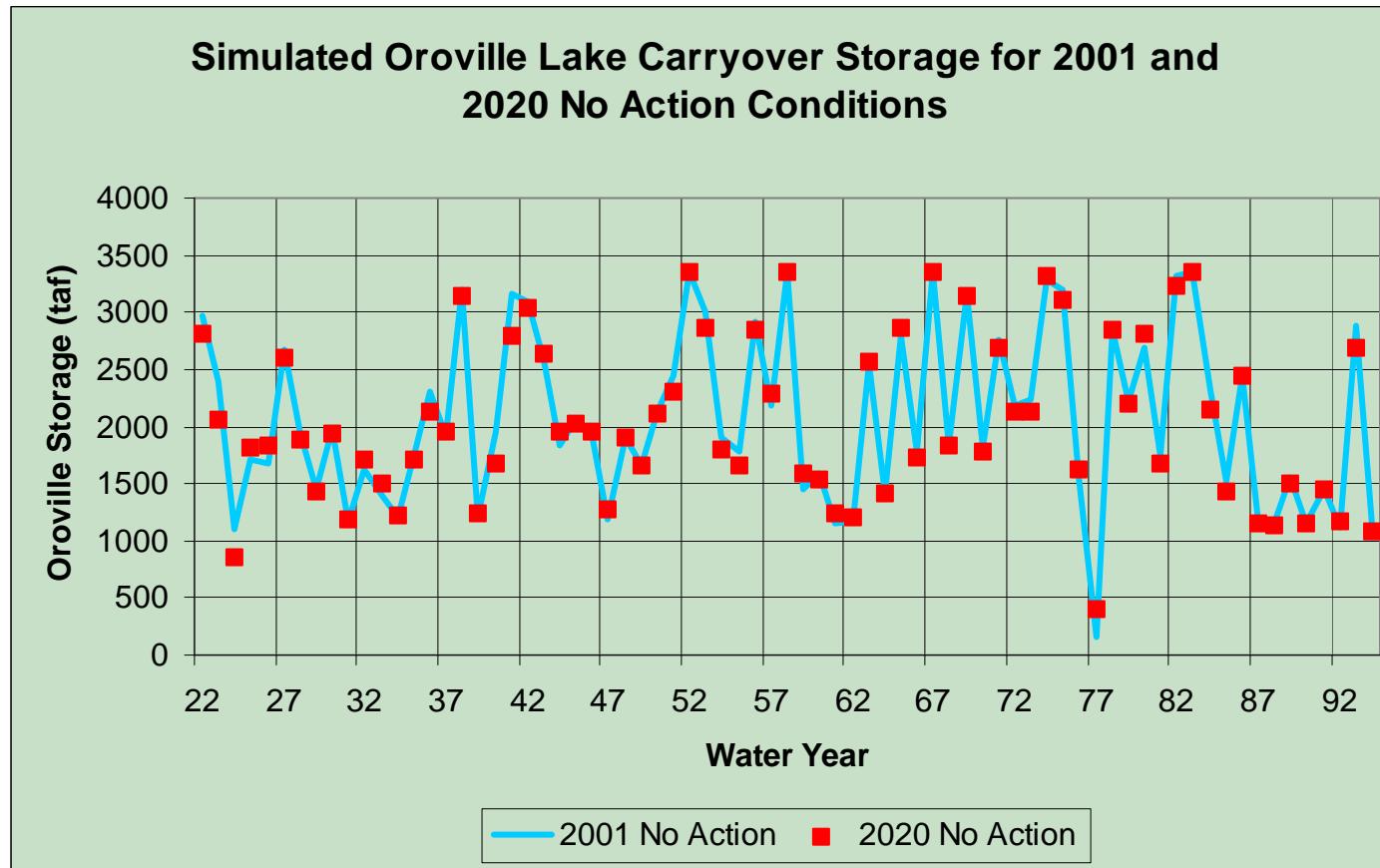


Figure C-4. Annual Carryover Storage (taf) at Folsom Lake for the 2001 and 2020 No Action Simulations

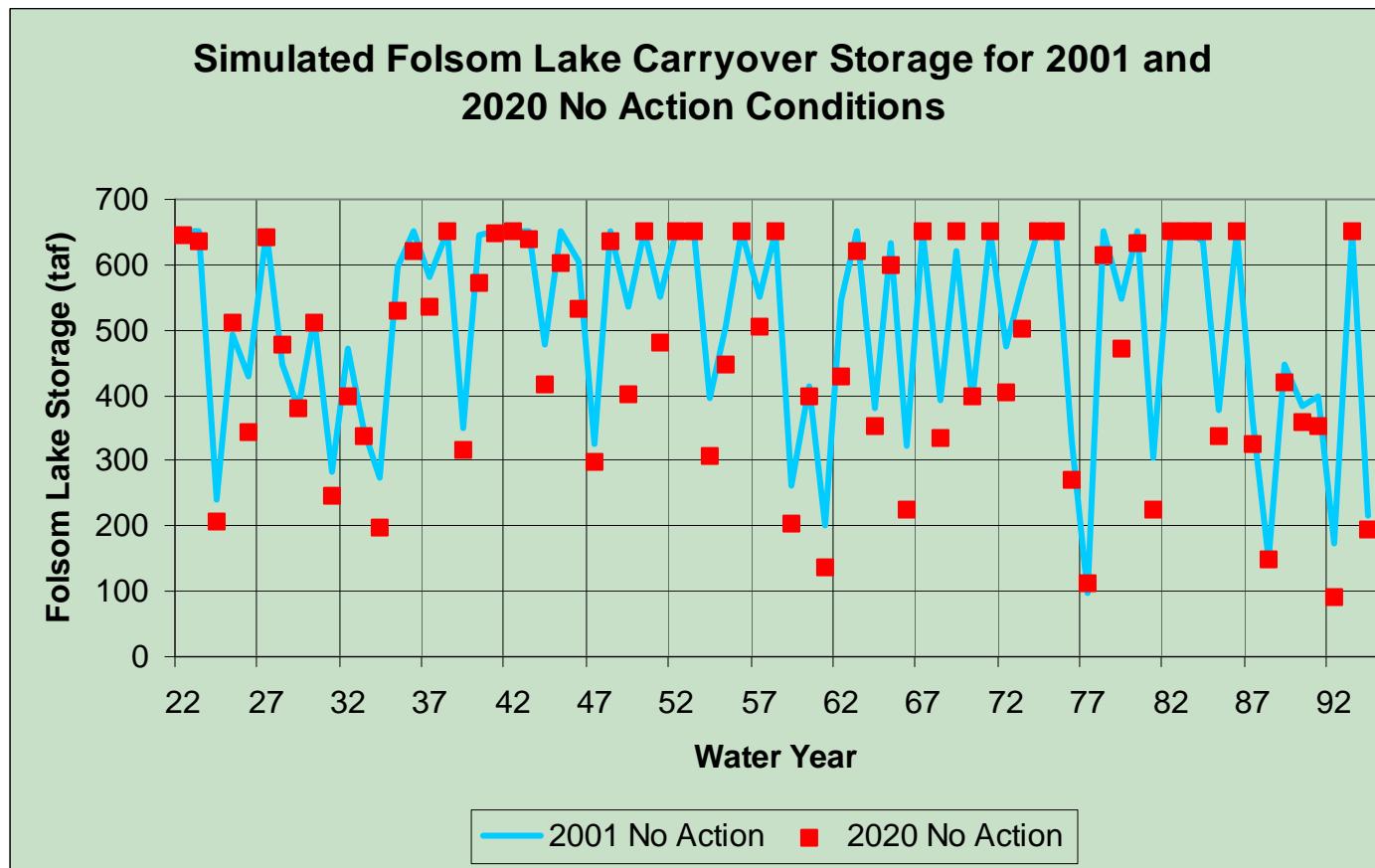


Figure C-5. Annual Carryover Storage (taf) at New Melones Reservoir for the 2001 and 2020 No Action Simulations

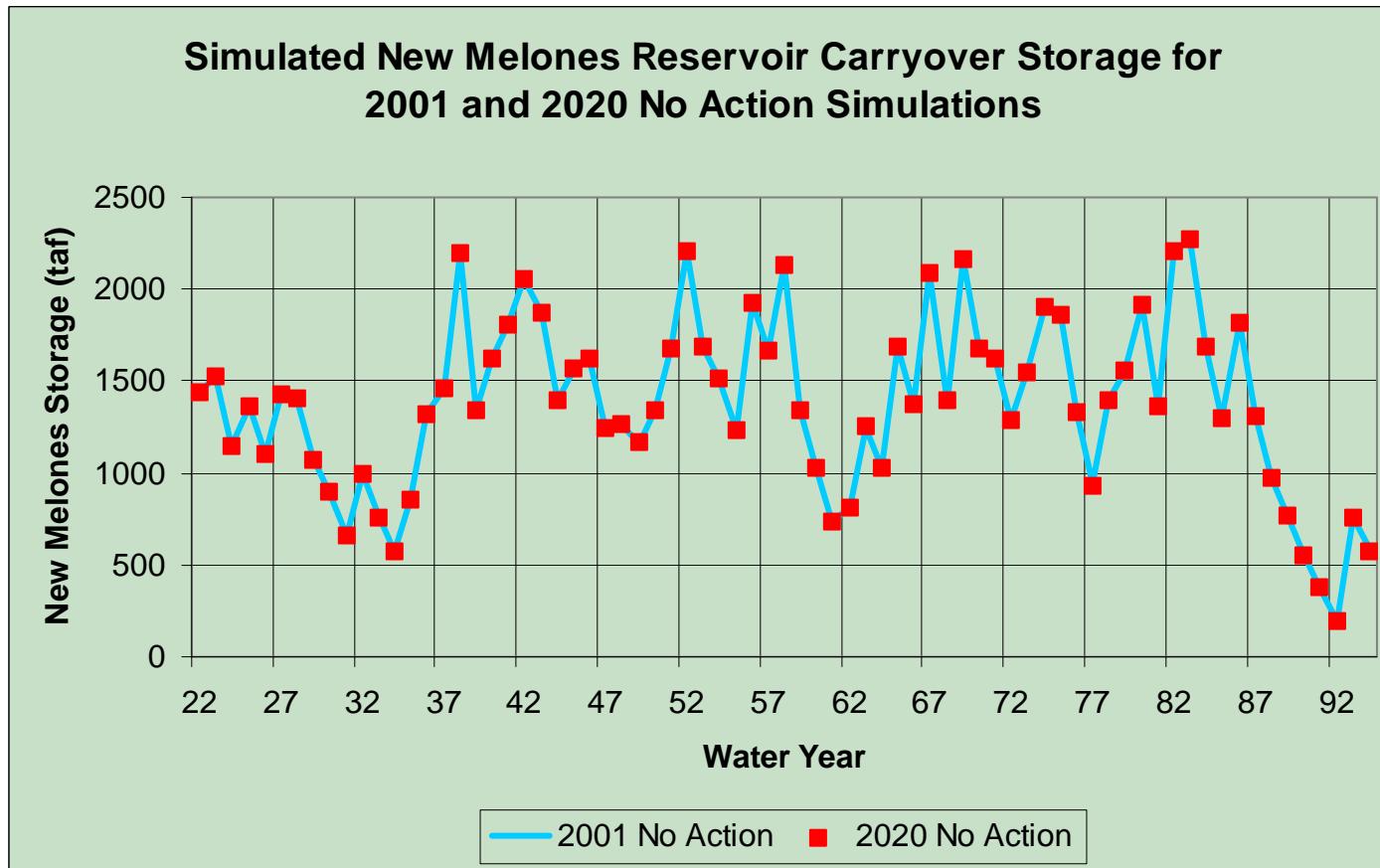


Table C-1. CALSIM Simulated Clair Engle Lake Storage (taf) for the 2001 No Action Conditions and Change in Carryover Storage for the 2002 and 2020 No Action Conditions

Year	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Carryover Storage minus 2001 No Action carryover storage (taf)	2020 No Action minus 2001 No Action carryover storage (taf)
1922	1782	1722	1723	1720	1743	1793	1891	1964	1974	1862	1708	1560	2	
1923	1474	1446	1455	1482	1505	1557	1671	1609	1570	1352	1147	1064	0	
1924	1040	1029	1023	917	961	963	905	822	696	583	515	473	-1	
1925	465	535	565	489	760	895	1192	1177	1126	1008	887	808	-5	
1926	782	776	795	796	940	1042	1261	1165	1109	972	832	747	-30	
1927	721	876	1071	1189	1427	1605	1833	1823	1852	1731	1617	1476	-24	
1928	1416	1474	1492	1549	1659	1865	2011	1949	1818	1665	1513	1398	-69	
1929	1336	1311	1303	1194	1219	1283	1311	1343	1289	1130	997	909	-8	
1930	825	808	936	952	1051	1176	1276	1188	1125	1014	906	822	-15	
1931	791	776	765	773	792	850	892	854	761	605	520	478	6	
1932	431	397	398	405	426	579	668	691	702	595	509	462	4	
1933	437	431	427	424	425	542	695	683	770	676	589	546	-14	
1934	529	521	530	591	681	815	836	810	694	576	502	428	-69	
1935	374	438	476	517	601	662	875	906	910	802	684	645	-65	
1936	631	626	629	742	883	1000	1158	1088	1043	937	836	755	-56	
1937	721	704	689	681	684	790	1015	1158	1256	1152	1068	985	-28	
1938	961	1103	1322	1419	1576	1836	2144	2319	2262	2235	2118	1975	0	
1939	1850	1850	1847	1778	1774	1876	1952	1890	1748	1567	1332	1192	75	
1940	972	928	992	1167	1493	1795	2022	1959	1843	1664	1514	1405	-8	

Table C-1. Continued

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Year	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	2020 No Action minus 2001 No Action carryover storage (taf)
1941	1348	1329	1468	1689	1939	2100	2300	2420	2447	2270	2150	1975	0
1942	1850	1850	1850	1900	2000	1987	2194	2254	2326	2270	2150	1975	0
1943	1850	1850	1850	1900	2000	2100	2281	2172	2101	1957	1838	1693	0
1944	1636	1646	1640	1641	1684	1751	1789	1843	1795	1590	1441	1326	-50
1945	1263	1266	1331	1385	1550	1604	1738	1702	1654	1511	1377	1263	-49
1946	1220	1275	1466	1596	1652	1777	1991	1986	1892	1761	1591	1448	-38
1947	1388	1382	1394	1385	1437	1547	1632	1541	1526	1333	1162	1030	-26
1948	1043	1054	1055	1248	1270	1295	1476	1471	1506	1380	1269	1250	-58
1949	1242	1249	1253	1246	1284	1499	1759	1766	1682	1538	1407	1293	-57
1950	1232	1200	1190	1217	1273	1395	1549	1554	1536	1413	1278	1166	-32
1951	1259	1375	1632	1723	1943	2047	2223	2154	1992	1845	1697	1552	-31
1952	1468	1474	1621	1680	1870	2036	2300	2412	2447	2270	2150	1975	0
1953	1850	1845	1850	1900	1943	2071	2278	2237	2330	2270	2150	1975	0
1954	1850	1850	1850	1900	2000	2100	2300	2272	2125	1989	1802	1665	0
1955	1617	1667	1724	1742	1745	1780	1832	1830	1816	1669	1491	1374	14
1956	1311	1295	1604	1900	2000	2099	2290	2392	2311	2194	2081	1975	0
1957	1850	1850	1813	1796	1957	2100	2168	2185	2165	2020	1825	1687	13
1958	1778	1850	1850	1900	2059	2100	2300	2420	2430	2270	2150	1975	0
1959	1850	1850	1830	1900	2000	2002	2131	2031	1931	1700	1499	1282	7
1960	1220	1182	1170	1179	1321	1500	1617	1562	1536	1379	1241	1127	-26

Table C-1. Continued

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Year	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	2020 No Action minus 2001 No Action carryover storage	
													(taf)	
1961	1099	1102	1192	1229	1452	1580	1724	1694	1690	1552	1406	1293		3
1962	1230	1209	1232	1236	1370	1447	1663	1585	1524	1383	1259	1148		3
1963	1253	1305	1479	1519	1814	1893	2160	2200	2142	1998	1875	1847		-128
1964	1844	1850	1850	1900	1887	1924	1889	1786	1730	1540	1361	1247		63
1965	1179	1209	1746	1900	1965	1946	2181	2096	2036	1901	1766	1629		5
1966	1569	1657	1697	1780	1848	2054	2300	2312	2254	2099	1898	1752		-34
1967	1604	1686	1829	1900	2000	2100	2211	2333	2434	2270	2150	1975		0
1968	1850	1850	1836	1846	2000	2095	2164	2055	1899	1720	1574	1404		4
1969	1348	1344	1403	1547	1672	1834	2170	2420	2349	2270	2150	1975		0
1970	1850	1850	1850	1900	2000	2080	2132	2040	1938	1758	1605	1428		16
1971	1369	1474	1605	1840	1922	2100	2282	2332	2347	2270	2150	1975		0
1972	1850	1850	1842	1900	2000	2100	2240	2178	2052	1905	1759	1612		-14
1973	1531	1561	1670	1831	1985	2100	2267	2332	2282	2145	1944	1804		-10
1974	1776	1850	1850	1900	2000	2100	2300	2400	2394	2270	2150	1975		0
1975	1850	1849	1841	1828	1925	2100	2231	2344	2447	2270	2150	1975		0
1976	1850	1850	1837	1703	1737	1789	1875	1857	1809	1591	1421	1310		26
1977	1245	1210	1184	1173	1166	1153	1062	1012	885	689	569	536		-16
1978	513	522	663	1064	1249	1535	1736	1753	1708	1624	1514	1430		-21
1979	1369	1366	1362	1384	1438	1587	1695	1782	1749	1642	1488	1376		24
1980	1344	1380	1443	1672	1975	2077	2224	2137	2005	1883	1733	1589		6

Table C-1. Continued

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Year	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	2020 No Action minus 2001 No Action carryover storage (taf)
1981	1525	1502	1533	1640	1779	1905	2015	1946	1887	1736	1547	1426	-9
1982	1374	1617	1850	1900	2000	2100	2300	2311	2179	2063	1948	1921	0
1983	1850	1850	1850	1900	2000	2100	2300	2420	2447	2270	2150	1975	0
1984	1850	1850	1850	1900	1998	2100	2215	2178	2050	1916	1772	1631	0
1985	1596	1724	1778	1742	1771	1818	1964	1884	1809	1581	1359	1222	-12
1986	1150	1138	1148	1277	1761	2100	2105	1999	1886	1669	1485	1376	26
1987	1322	1287	1274	1284	1361	1573	1725	1639	1444	1220	1005	885	3
1988	848	834	1003	1081	1167	1252	1328	1267	1218	1055	901	802	-8
1989	748	783	797	818	843	1187	1391	1284	1166	1021	917	839	-16
1990	852	849	839	899	919	1005	1046	1018	1014	903	780	694	-8
1991	672	659	647	642	652	730	795	822	799	691	628	589	-9
1992	571	561	557	565	704	846	1081	1073	945	766	612	541	-12
1993	524	503	526	588	732	1110	1314	1496	1591	1569	1459	1418	-2
1994	1402	1388	1409	1446	1477	1544	1591	1599	1487	1268	1030	893	7
Avg.	1280	1296	1347	1402	1508	1627	1773	1770	1722	1579	1439	1324	-10
Min.	374	397	398	405	425	542	668	683	694	576	502	428	-128
Max.	1850	1850	1850	1900	2059	2100	2300	2420	2447	2270	2150	1975	75

Table C-2. CALSIM-Simulated Exports (cfs) from the Trinity River for the 2001 No Action Conditions

Year	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Annual Total (taf)	2020 minus 2001
1922	3300	1027	262	250	100	100	333	100	750	1500	2000	2000	712	-2
1923	1250	500	138	100	100	189	317	602	750	3300	2880	1000	678	1
1924	250	100	100	1753	329	166	1042	211	1365	1360	627	250	457	2
1925	0	94	286	2088	0	100	100	0	250	1250	1623	1132	423	4
1926	250	100	100	100	100	191	100	100	513	1802	1805	1000	375	26
1927	250	100	100	100	0	100	0	0	0	1500	1500	2000	343	-6
1928	750	0	105	100	100	0	267	0	750	1500	2001	1500	429	46
1929	750	500	250	1940	100	0	215	250	1000	2250	1692	1028	607	-60
1930	1082	100	100	100	100	100	403	100	902	1453	1297	1000	409	7
1931	250	100	136	100	100	100	100	100	1371	2140	934	250	345	-22
1932	515	446	40	88	0	0	0	0	250	1500	991	354	255	2
1933	109	73	43	2	0	0	0	0	775	1540	1039	345	239	18
1934	0	0	0	0	0	367	1455	158	1548	1544	756	813	401	56
1935	707	0	0	0	0	0	0	100	250	1500	1500	250	264	-2
1936	0	0	0	0	0	0	313	0	250	1000	1250	1000	231	-7
1937	250	100	100	0	0	0	0	100	250	1750	1000	1000	277	-27
1938	250	100	0	0	0	0	0	0	19	39	1500	2008	237	-28
1939	1941	255	552	1413	419	100	339	667	1924	2500	3300	1896	930	-75
1940	3300	568	100	100	0	0	250	0	750	2000	2000	1500	644	83
1941	750	500	0	0	0	0	0	2024	467	3300	1951	2716	713	0
1942	1858	293	0	0	0	1593	0	0	2	619	1603	2558	519	0

Table C-2. Continued

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Year	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Annual Total (taf)	2020 minus 2001
1943	1784	431	1055	0	396	1163	319	0	186	1500	1500	2000	627	0
1944	750	0	138	155	100	100	450	250	1250	3102	2000	1500	595	51
1945	750	500	250	100	0	100	303	0	0	1500	1750	1500	411	0
1946	750	0	0	0	100	63	234	0	750	1500	2375	2000	471	-11
1947	750	500	250	250	250	250	388	250	750	2862	2378	1796	648	-11
1948	250	100	100	100	100	250	100	0	750	1500	1500	0	290	33
1949	0	0	71	137	0	0	100	0	750	1500	1750	1500	352	0
1950	750	500	104	100	100	100	250	250	750	1750	1750	1500	479	-24
1951	250	0	0	0	0	100	412	0	1374	1500	2000	2000	462	0
1952	1250	500	0	0	0	0	0	0	116	2844	1670	2567	544	-31
1953	1781	0	586	0	1463	0	150	0	0	1369	1745	2603	582	0
1954	1890	1395	875	570	0	2256	2290	0	1374	1500	2750	2000	1025	0
1955	611	0	0	100	566	92	47	250	750	2129	2526	1619	526	-14
1956	750	500	0	0	0	839	1278	0	0	1500	1500	1389	471	0
1957	1856	83	736	358	0	544	954	0	0	1511	2750	2000	658	-13
1958	0	125	1650	1756	2778	0	0	2381	19	2795	1820	2602	957	13
1959	1809	0	323	1821	79	2117	977	0	750	2809	2829	3300	1023	-7
1960	750	500	104	100	100	250	286	0	750	1750	1850	1500	482	33
1961	250	100	100	3	0	0	268	0	750	1500	2000	1500	393	-29
1962	750	500	250	250	0	100	406	0	750	1500	1750	1500	471	0
1963	0	0	0	100	0	0	0	0	83	1500	1500	0	196	131
1964	0	1884	698	487	1131	100	1407	250	1250	2903	2643	1629	865	-192

Table C-2. Continued

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Year	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Annual Total (taf)	2020 minus 2001
1965	1000	100	0	0	575	1591	0	0	32	1500	2000	2006	534	3
1966	750	0	0	0	0	0	1153	0	89	1833	2990	2181	546	40
1967	2229	500	0	712	666	86	0	0	0	2494	1755	2657	672	-34
1968	1998	111	584	1291	0	916	802	0	1500	2000	2000	2500	833	-2
1969	750	500	250	0	0	0	0	159	0	774	1551	2494	392	4
1970	1873	14	153	2365	65	1117	532	0	750	2106	2000	2500	821	-19
1971	750	500	0	0	1066	293	0	0	0	915	1559	2481	453	12
1972	1770	237	501	868	281	3300	117	0	1500	1500	2000	2000	856	14
1973	1250	168	0	0	0	170	603	0	5	1500	2750	2000	514	-4
1974	750	4	0	2265	168	0	651	0	39	1977	1693	2511	611	0
1975	1694	0	479	685	0	0	250	0	329	2685	1650	2599	631	1
1976	1982	524	862	2457	100	112	182	250	750	3300	2500	1500	886	-26
1977	750	500	250	105	133	240	1530	100	1725	2730	1611	360	608	42
1978	255	345	958	0	0	0	0	0	0	1500	1500	1500	369	6
1979	750	0	0	100	100	100	403	100	750	1500	2000	1500	443	-44
1980	750	500	100	0	0	653	467	0	1374	1500	2000	2000	566	18
1981	750	250	250	100	100	0	200	100	750	2000	2500	1500	517	15
1982	750	0	0	661	0	1348	0	0	0	1500	1500	0	354	65
1983	1475	615	0	0	0	1057	1024	2914	3300	3300	2512	2909	1159	0
1984	1972	2161	0	1660	0	813	315	0	1374	1500	2000	2000	837	0
1985	393	0	0	1107	289	164	391	250	1250	3300	3165	1889	741	12
1986	1000	100	100	100	0	0	2580	0	750	2625	2560	1500	686	-35

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Year	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Annual Total (taf)	2020 minus 2001
1987	750	500	250	250	250	100	251	929	3159	3300	3076	1498	868	22
1988	250	100	100	100	0	100	415	250	1628	2500	2079	1139	526	11
1989	531	100	100	100	100	100	100	0	750	1361	1250	1000	333	8
1990	250	100	112	100	100	100	352	0	518	1544	1500	1000	345	-7
1991	0	0	0	0	0	0	0	0	480	1500	656	250	176	1
1992	0	0	0	0	0	0	0	100	2166	2724	2040	744	472	3
1993	4	346	0	0	0	0	100	0	0	0	1500	257	134	-10
1994	0	0	2	100	100	113	446	250	1418	3029	3300	1779	640	-9
Avg.	863	286	202	407	174	329	393	186	735	1886	1901	1560	542	0
Min.	0	0	0	0	0	0	0	0	0	0	627	0	134	-192
Max.	3300	2161	1650	2457	2778	3300	2580	2914	3300	3300	3300	3300	1159	131

Table C-3. CALSIM-Simulated Shasta Storage (taf) for the 2001 No Action Conditions and Change in Caryover storage for the 2020 No Action Conditions

Year	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	2020 minus 2001 (taf)
1922	2806	2843	2929	3033	3393	3775	4252	4386	4092	3477	3069	2905	19
1923	2938	3025	3156	3355	3483	3612	3918	3635	3234	2738	2384	2270	16
1924	2208	2132	2080	2192	2356	2362	2147	1830	1449	1050	750	624	-19
1925	628	780	892	1173	2411	2554	3219	3285	2942	2515	2169	2044	-8
1926	1989	1987	2038	2080	2807	3009	3302	3153	2783	2347	2046	1935	-67
1927	1955	2439	2945	3484	3462	4094	4552	4552	4264	3756	3349	3206	-64
1928	3164	3252	3327	3592	4058	3965	4463	4335	3940	3302	2909	2739	14
1929	2648	2618	2618	2787	2982	3159	3213	3099	2847	2405	2057	1936	-9
1930	1853	1806	2329	2534	2906	3382	3540	3431	3066	2658	2291	2180	-35
1931	2133	2129	2115	2189	2279	2446	2218	1941	1604	1084	756	642	22
1932	608	611	802	962	1078	1511	1682	1891	1721	1436	1222	1105	16
1933	1043	1028	1016	1041	1080	1665	1822	1883	1745	1393	1068	926	-70
1934	830	789	913	1207	1533	1815	1895	1726	1375	980	658	622	-27
1935	602	687	723	1017	1337	1726	2721	2945	2656	2312	1973	1804	-65
1936	1778	1747	1755	2378	3260	3619	3844	3727	3513	2958	2532	2372	-15
1937	2265	2181	2106	2085	2177	2822	3476	3625	3465	3137	2751	2597	-65
1938	2549	3108	3310	3668	3560	3416	4058	4552	4466	3969	3625	3400	0
1939	3250	3252	3361	3557	3689	4090	3894	3601	3087	2485	2098	1995	-104
1940	2058	2005	2089	2959	3252	3435	4152	4084	3726	3192	2800	2661	-49
1941	2647	2669	3293	3317	3423	3940	4456	4552	4494	4100	3700	3400	0

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Year	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	2020 minus 2001 (taf)
1942	3250	3252	3316	3389	3516	3938	4552	4552	4457	3907	3555	3400	0
1943	3250	3252	3356	3541	3848	4118	4552	4521	4272	3741	3348	3223	-73
1944	3200	3187	3175	3254	3560	3871	3857	3755	3491	3011	2641	2514	-31
1945	2509	2731	3046	3237	3948	4245	4415	4411	4133	3557	3149	2983	-57
1946	3037	3252	3265	3622	3711	4080	4273	4195	3829	3307	2944	2835	-46
1947	2760	2867	2976	2926	3195	3727	3866	3510	3269	2722	2359	2263	-21
1948	2301	2351	2383	2947	2744	3060	3962	4312	4335	3952	3575	3400	0
1949	3250	3200	3201	3206	3396	4071	4392	4341	3947	3286	2879	2727	31
1950	2629	2602	2548	2825	3232	3681	4021	3965	3678	3209	2866	2783	-21
1951	3084	3252	3322	3624	3794	4237	4325	4338	3993	3349	2962	2861	-80
1952	2904	3102	3306	3604	3739	4022	4290	4552	4401	4102	3700	3400	0
1953	3250	3212	3345	3366	3753	4226	4552	4552	4500	4039	3700	3400	0
1954	3250	3252	3364	3552	3661	4106	4546	4316	4128	3527	3302	3266	-126
1955	3250	3216	3360	3482	3601	3769	3800	3884	3469	2977	2685	2614	29
1956	2591	2649	3252	3252	3288	4012	4522	4552	4376	3908	3598	3400	0
1957	3250	3200	3241	3367	3675	4129	4166	4427	4166	3563	3259	3297	-40
1958	3250	3217	3338	3531	3252	3416	4173	4552	4500	4140	3700	3400	0
1959	3250	3200	3302	3648	3777	4071	4119	3905	3303	2763	2342	2416	-75
1960	2290	2192	2171	2364	3081	3778	3944	3937	3639	3024	2598	2551	-65
1961	2458	2588	3050	3254	3914	4280	4323	4294	3950	3313	2724	2514	37
1962	2379	2397	2686	2754	3675	4175	4450	4356	4021	3405	2984	2885	-63
1963	3250	3252	3349	3514	3944	3989	4552	4552	4336	3875	3571	3400	-73

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Year	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	2020 minus 2001 (taf)
1964	3250	3252	3366	3705	3922	4052	3709	3487	3256	2809	2435	2348	77
1965	2349	2497	3252	3368	3788	3918	4500	4439	4132	3530	3270	3214	-80
1966	3195	3252	3340	3725	4037	4229	4552	4416	3809	3200	2851	2784	-9
1967	2708	3034	3335	3551	3920	4033	4479	4552	4500	4150	3700	3400	0
1968	3250	3220	3322	3618	3654	4232	4202	4079	3676	3087	2796	2721	-67
1969	2715	2737	3039	3358	3480	4030	4434	4552	4399	3861	3500	3400	0
1970	3250	3252	3317	3252	3431	4104	4060	3922	3632	3067	2746	2709	-101
1971	2703	3229	3319	3515	3679	3873	4373	4552	4500	4042	3700	3400	0
1972	3250	3200	3338	3714	3979	4249	4421	4307	3849	3235	2870	2858	-20
1973	2965	3252	3346	3552	3636	4162	4454	4432	4035	3421	3164	3128	-71
1974	3211	3252	3267	3252	3694	3416	4289	4480	4348	4067	3700	3400	0
1975	3250	3215	3341	3515	3936	3756	4343	4552	4440	4083	3700	3400	0
1976	3250	3252	3328	3543	3723	3953	4027	3829	3366	2953	2898	2908	38
1977	2853	2920	2960	2988	2963	2948	2598	2436	1932	1349	948	873	-63
1978	697	733	1254	3170	3567	4000	4552	4552	4235	3632	3295	3289	-58
1979	3200	3193	3182	3340	3691	4198	4376	4395	3871	3247	2983	2897	-113
1980	2956	3145	3304	3528	3292	4028	4330	4263	3958	3394	3073	3037	-24
1981	3017	2993	3100	3409	3816	4256	4397	4158	3550	2915	2550	2458	-116
1982	2503	3252	3276	3616	3530	3953	4094	4304	4138	3779	3533	3400	0
1983	3250	3252	3328	3371	3252	3417	4074	4552	4500	4150	3700	3400	0
1984	3250	3252	3285	3650	4005	4246	4345	4309	4067	3465	3245	3241	-61
1985	3250	3252	3360	3483	3666	3877	3984	3629	3180	2688	2356	2328	-112

Table C-3. Continued

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Year	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	2020 minus 2001 (taf)
1986	2342	2361	2510	3078	3252	3534	3980	3918	3511	3124	2805	2819	55
1987	2865	2849	2850	2978	3318	4045	3828	3510	2995	2537	2291	2188	12
1988	2053	2052	2570	3009	2926	2998	3017	3015	2587	2154	1840	1693	-63
1989	1567	1778	1880	1991	2105	3493	3886	3699	3379	2763	2381	2400	-82
1990	2517	2506	2471	2718	2712	2982	2816	2964	2744	2210	1962	1887	-33
1991	1764	1726	1712	1715	1735	2160	2310	2237	1971	1674	1414	1318	-50
1992	1285	1245	1240	1286	1944	2390	2612	2304	1899	1473	1057	863	-12
1993	740	660	891	1539	2271	3732	4367	4542	4500	3812	3541	3400	0
1994	3250	3225	3317	3450	3683	3795	3636	3333	2848	2263	1779	1610	32
Avg.	2566	2624	2761	2998	3253	3609	3884	3859	3568	3070	2722	2598	-29
Min.	602	611	723	962	1078	1511	1682	1726	1375	980	658	622	-126
Max.	3250	3252	3366	3725	4058	4280	4552	4552	4500	4150	3700	3400	77

Table C-4. CALSIM-Simulated Monthly Keswick Dam Release Flows (cfs) for the 2001 No Action Conditions and Change in 2020 No Action Conditions

Year	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Annual Total (taf)	2020 minus 2001 (taf)
1922	6058	4255	4042	3250	3250	3250	4516	7669	10704	14724	11540	7731	4907	-21
1923	4457	3250	3250	3250	3250	3250	4431	10592	11568	14355	11370	5945	4786	-14
1924	4915	4768	4275	3420	3250	3724	7684	8058	10221	10326	7999	5269	4470	7
1925	3250	3250	3250	3250	3250	6289	3908	6184	10469	10987	9809	6232	4245	1
1926	4910	4299	3250	3250	3250	3250	4167	6558	9568	11352	9095	5544	4145	86
1927	3250	3250	3250	3250	26521	3600	9839	8606	10155	13110	11037	7432	6133	-8
1928	4777	6198	4275	3420	3250	17700	4643	8110	10922	15000	11173	7259	5871	-33
1929	5458	5033	4275	3420	3250	3250	5569	7112	8781	12081	9870	5754	4472	-29
1930	5475	3887	3250	3250	3250	3250	4314	6723	10285	10703	9753	5583	4220	57
1931	4047	3297	3250	3250	3250	3250	7770	7447	9670	13738	8613	4842	4383	-89
1932	3586	3250	3250	3250	3250	3250	4388	3816	6519	8463	7814	4788	3363	32
1933	3634	3250	3250	3250	3250	3250	5321	5638	7429	9995	8792	5428	3780	103
1934	4390	3630	3250	3250	3250	3250	5338	6825	10306	10367	8269	5212	4073	14
1935	3656	3250	3250	3250	3250	3250	3250	5751	9338	10033	9549	5806	3850	37
1936	3534	3583	3250	3250	3250	3250	4433	7122	8445	12853	10535	6112	4217	-44
1937	4684	4251	4038	3250	3250	3250	4107	6629	8160	10069	9701	6015	4081	45
1938	4091	3250	15161	3958	30086	33790	12271	7885	9000	12474	10698	9211	9093	-92
1939	8691	4707	4275	3420	3250	3250	8917	9152	14169	15000	12104	6462	5655	8
1940	5112	4684	4275	3420	27081	20587	4343	7537	10868	13865	11298	6879	7161	31
1941	4565	4286	8531	24464	22703	12933	13240	13223	9000	14415	12351	11591	9093	-56

Table C-4. Continued

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Year	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Annual Total (taf)	2020 minus 2001 (taf)
1942	8331	4604	16733	17912	27053	3600	4879	11253	9000	13918	11018	8925	8222	0
1943	8223	5494	6409	12039	8086	12366	4969	8000	9820	13938	11313	7556	6551	72
1944	4808	4374	4154	3323	3250	3250	6820	7192	10051	14219	11002	6612	4786	20
1945	4482	3250	3250	3250	4315	3452	4830	7886	10023	13946	11333	7377	4683	16
1946	4549	4610	22448	7259	6160	3600	6519	8584	11298	13571	11621	7018	6499	6
1947	5444	3623	3362	4637	3250	3250	4860	9996	11023	14830	11674	6412	4994	-37
1948	4009	3250	3250	3250	8164	3600	4218	7409	8750	11384	10585	6160	4459	9
1949	5970	4880	4275	3420	3250	8848	4714	7856	11120	15000	11082	6676	5281	-25
1950	5512	4366	4148	3318	3250	3250	4466	7361	9128	12050	9956	5588	4385	29
1951	4260	7427	15008	7454	15457	3600	6818	7767	11238	14938	11163	6633	6717	58
1952	4364	3802	14700	7927	18376	10783	17283	9021	9000	12081	11531	11068	7799	-109
1953	8010	4583	9317	28398	3600	3250	4912	10710	9728	13278	10605	11272	7153	-9
1954	8314	8079	4938	13861	18089	10991	12379	11257	9690	15000	10160	6400	7762	119
1955	4784	6541	5984	3600	4404	3250	8996	7026	11972	13291	10271	6100	5209	-112
1956	4338	4643	22270	30353	21696	3600	4675	11151	9000	13008	10140	8278	8620	38
1957	8973	5207	4116	3293	10544	9841	10307	7553	9678	15000	10976	5492	6085	28
1958	7408	7194	10268	13862	53770	20634	11699	9118	9311	13755	13043	11647	10774	-28
1959	8830	5246	3250	12540	13885	7341	8433	9227	15000	15000	12795	6355	7098	68
1960	6570	5897	4275	3420	3250	3250	5009	7258	10639	15000	12159	5667	4993	21
1961	5130	3335	3250	3250	4199	5924	7519	7944	11163	15000	14563	8113	5412	-124
1962	6589	5862	4275	4287	6977	3600	5348	8131	10591	14462	11664	6249	5316	96
1963	4964	5254	8819	3600	9092	10361	5000	12140	9021	13000	10012	6499	5906	976

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Year	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Annual Total (taf)	2020 minus 2001 (taf)
1964	6703	10365	3692	5163	3790	3680	13076	8563	10111	12987	11451	6082	5781	-397
1965	4473	3250	15101	21039	3600	6430	7286	8776	9670	15000	9473	6327	6716	142
1966	4742	8296	4275	5959	5906	11756	7336	8424	14644	15000	11842	6495	6328	-43
1967	6426	4490	10308	9678	7970	15000	10011	14154	9439	12502	12846	11394	7521	-31
1968	8766	4866	4116	3293	18144	3600	8401	7885	12307	15000	10397	7410	6233	65
1969	4969	4878	4195	19252	21308	5686	11792	11484	9061	13689	10894	8296	7523	-62
1970	8727	4416	15000	52774	13191	3600	8217	8046	10283	15000	10866	6648	9502	82
1971	5389	3250	15384	14467	8660	14771	5714	8902	9165	13113	10296	11210	7289	-89
1972	8858	5975	4275	3782	5472	14473	8700	8009	13698	15000	11436	5950	6394	34
1973	4301	3250	6943	14513	18779	7147	4775	7939	10802	15000	10103	6038	6577	66
1974	4632	27590	20315	38498	5479	35234	6922	7719	8974	11535	11878	11967	11586	-63
1975	8624	5620	4275	3420	8465	27500	4504	9431	9722	12790	11740	11814	7137	1
1976	9869	5636	4275	3420	3327	3250	5111	8045	11970	13656	7209	5030	4893	-48
1977	5094	3311	3250	3250	4395	4113	10172	6141	13267	15000	11253	5680	5132	97
1978	7097	4038	3250	3300	12979	14247	6368	9054	10326	15000	10269	5545	6110	-8
1979	5792	4045	3791	3250	3250	3250	4834	7906	12972	14633	9160	5911	4771	15
1980	4396	3250	3250	17064	30104	3600	4685	7774	10728	14119	10273	6250	6873	-70
1981	4526	5035	4275	3420	3250	5792	4837	8979	14382	15000	10878	5958	5229	109
1982	3908	5924	22223	7726	23313	13536	24662	7459	8739	11519	9142	5884	8628	-45
1983	8706	6832	12847	19127	34947	45897	10136	12724	14927	14778	14318	12549	12481	0
1984	9319	13793	24635	7553	4223	10301	7751	8360	10895	15000	9143	5751	7691	62
1985	4742	10534	5617	4223	3250	3250	5247	10004	12267	14436	11648	6076	5526	65

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Year	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Annual Total (taf)	2020 minus 2001 (taf)
1986	4969	4083	3879	3250	43277	19820	4392	8251	11637	12726	11141	5287	7852	-194
1987	4252	4724	4275	3420	3250	3250	9673	10478	14865	14057	9517	6508	5337	34
1988	6104	4046	3250	3250	7900	4583	5085	6086	13014	11997	9918	6790	4939	83
1989	5964	3250	3250	3250	3250	3250	4360	8288	9351	13996	10161	4149	4398	22
1990	3726	4175	3934	3250	5171	3250	6766	5832	9928	13265	8496	5237	4408	-36
1991	5401	4049	3250	3250	3423	3250	3477	6684	7960	9034	7452	4601	3742	18
1992	3780	3258	3250	3250	3250	3250	3826	9501	12266	12588	11168	6931	4621	-41
1993	5621	5098	3250	3250	3250	3250	4491	7823	9837	15000	9203	5881	4601	-21
1994	6093	3919	3723	3250	3250	4236	7043	9406	12513	15000	13713	7314	5420	-44
Avg.	5649	5156	6777	7885	9977	8038	6942	8392	10569	13384	10648	6961	6054	12
Min.	3250	3250	3250	3250	3250	3250	3250	3816	6519	8463	7209	4149	3363	-397
Max.	9869	27590	24635	52774	53770	45897	24662	14154	15000	15000	14563	12549	12481	976

Table C-5. CALSIM-Simulated Oroville Storage (taf) for the 2001 No Action Conditions and Change in Carryover Storage for the 2020 No Action Conditions

Year	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	2020 minus 2001
1922	2542	2548	2546	2680	2813	2922	3446	3538	3538	3381	3013	2975	-168
1923	3016	3067	2922	2976	3089	3163	3459	3538	3349	2895	2452	2386	-317
1924	2293	2182	1946	1999	2183	2145	2078	1994	1699	1404	1209	1097	-239
1925	1069	1113	1159	1297	1912	2067	2356	2486	2383	2212	1774	1710	104
1926	1654	1682	1682	1821	2322	2614	3237	3084	2735	2255	1900	1677	156
1927	1512	1826	1814	2116	2788	2999	3396	3538	3391	3174	2761	2672	-71
1928	2621	2778	2771	2945	3108	2797	3223	3225	2873	2606	2146	1934	-54
1929	1785	1727	1721	1771	1887	2024	2062	2046	1901	1705	1549	1442	-11
1930	1376	1307	1930	2210	2432	2898	3208	3327	3049	2534	2134	1978	-45
1931	1938	1928	1882	2016	2142	2343	2265	2220	2026	1551	1301	1178	9
1932	1081	1068	1031	1235	1420	1743	2022	2350	2315	2167	1749	1625	83
1933	1522	1430	1454	1555	1643	1604	1670	1806	1756	1580	1448	1389	122
1934	1350	1350	1362	1588	1738	2012	1992	1923	1747	1559	1372	1209	22
1935	1090	1138	1203	1436	1631	1907	2916	3281	2915	2360	1898	1742	-31
1936	1521	1430	1355	1866	2643	2954	3344	3524	3305	2875	2414	2303	-174
1937	2060	1956	1862	1903	2074	2426	2807	3144	3099	2562	2077	1917	32
1938	1861	2039	2867	2924	2788	2788	3277	3538	3538	3490	3185	3193	-57
1939	3163	3163	3163	3134	3163	3133	3105	2925	2586	2003	1475	1200	46
1940	975	872	881	1386	2376	2788	3238	3324	3004	2436	1999	1957	-276
1941	1926	1898	2410	2788	2788	2918	3334	3538	3538	3459	3193	3170	-372
1942	3163	3163	2788	2788	2806	3058	3281	3538	3538	3441	3111	3085	-45

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Year	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	2020 minus 2001
1943	3107	3085	2966	2788	2890	2937	3350	3515	3310	3007	2622	2578	66
1944	2592	2634	2614	2716	2885	3069	3213	3465	3141	2588	2118	1839	111
1945	1674	1747	1915	2077	2681	2974	3209	3464	3151	2595	2160	2060	-34
1946	2051	2139	2786	3007	3064	3063	3372	3538	3184	2645	2168	1934	20
1947	1759	1781	1870	1935	2212	2541	2655	2575	2369	1806	1314	1180	96
1948	1161	1155	1135	1448	1506	1703	2360	2822	2974	2484	2020	1911	-13
1949	1793	1726	1740	1793	1874	2161	2469	2668	2365	2062	1759	1666	-14
1950	1610	1619	1641	1923	2384	2827	3319	3538	3176	2637	2196	2130	-24
1951	2179	2746	2866	2846	2925	3105	3353	3538	3467	2942	2539	2445	-138
1952	2430	2487	2788	2788	2832	2988	3452	3538	3538	3538	3535	3350	0
1953	3163	3163	2918	2809	3059	3059	3284	3538	3538	3302	3031	2996	-139
1954	3025	3115	3163	2918	2903	2943	3292	3183	2950	2484	2087	1908	-110
1955	1767	1790	1882	2011	2099	2225	2332	2511	2247	1982	1869	1787	-123
1956	1710	1690	2788	2788	2788	3018	3427	3538	3452	3264	2927	2916	-73
1957	2990	3075	3163	3116	2847	2990	2986	3269	2981	2587	2279	2182	100
1958	2197	2242	2462	2763	2788	2788	3235	3538	3538	3511	3484	3350	0
1959	3163	3163	3163	2978	2839	3054	3159	3110	2654	2066	1589	1455	134
1960	1214	1112	1028	1153	1752	2317	2507	2606	2362	1943	1700	1597	-60
1961	1546	1583	1677	1790	2089	2349	2410	2467	2244	1779	1287	1145	92
1962	935	858	945	1068	1639	1987	2488	2658	2330	1843	1374	1174	33
1963	1843	1970	2335	2636	3057	2927	3180	3538	3207	2981	2581	2550	23
1964	2554	2730	2777	2930	3062	3163	2968	3055	2812	2244	1747	1420	-7

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Year	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	2020 minus 2001
1965	1250	1264	2788	2788	2997	3096	3354	3413	3470	3128	2821	2792	66
1966	2844	2943	2946	3015	3100	3163	3459	3340	2960	2440	1994	1785	-50
1967	1546	1656	2025	2661	2951	2847	3236	3538	3538	3538	3505	3350	0
1968	3162	3162	3141	2922	2962	3036	3030	3119	2840	2426	2031	1838	-1
1969	1700	1751	1973	2788	2788	3027	3470	3538	3538	3443	3419	3162	-16
1970	3162	3162	2806	2787	2787	3163	3129	3174	2841	2367	2014	1817	-29
1971	1767	2032	2448	2821	3119	3162	3433	3538	3538	3099	2790	2765	-82
1972	2832	2891	3014	3088	3058	3163	3321	3399	3089	2658	2270	2185	-59
1973	2139	2300	2577	2788	2788	2951	3286	3538	3094	2718	2324	2232	-97
1974	2260	2788	2800	2870	3009	2788	3292	3538	3383	3411	3312	3277	43
1975	3163	3163	3163	3163	2884	2833	3270	3538	3538	3360	3237	3204	-89
1976	3140	3163	3163	3163	3162	3163	3076	2956	2689	2113	1702	1574	54
1977	1446	1361	1253	1234	1192	1175	1039	961	683	330	170	157	240
1978	119	143	348	1255	1769	2662	3175	3477	3404	3231	2833	2856	-3
1979	2878	2937	2994	3111	2843	3001	3216	3498	3037	2667	2297	2211	-9
1980	2264	2322	2445	2813	2788	3028	3282	3465	3242	3126	2760	2691	113
1981	2667	2692	2821	2947	3075	3024	3186	3169	2829	2315	1857	1743	-62
1982	1634	2564	2788	2943	2987	2936	3303	3538	3538	3521	3277	3311	-73
1983	3149	2981	2930	2854	2788	2788	3208	3538	3538	3538	3538	3351	0
1984	3163	2950	2788	3091	3078	3120	3327	3470	3242	2843	2498	2317	-162
1985	2367	2575	2737	2829	3020	3117	3354	3186	2808	2247	1757	1511	-73
1986	1343	1271	1339	1664	2862	2788	3135	3213	3001	2747	2387	2449	-5

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Year	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	2020 minus 2001
1987	2481	2571	2589	2604	2765	3053	2921	2786	2337	1742	1240	1174	-22
1988	1030	1060	1395	1644	1717	1809	1840	1781	1604	1363	1215	1152	-24
1989	1110	1272	1367	1434	1574	2768	3151	3076	2697	2114	1626	1558	-48
1990	1503	1518	1395	1529	1512	1771	1727	1741	1657	1360	1156	1154	-9
1991	1117	1073	1073	1071	1086	1474	1671	1800	1735	1577	1477	1441	9
1992	1441	1381	1400	1439	1700	1943	2079	1909	1715	1495	1318	1119	58
1993	1124	1138	1303	1884	2394	2964	3456	3538	3538	3342	2939	2879	-195
1994	2949	3029	3133	3121	2985	3163	3125	3086	2731	1945	1439	1144	-62
Avg.	2037	2087	2196	2343	2516	2691	2949	3061	2865	2523	2188	2077	-26
Min.	119	143	348	1068	1086	1175	1039	961	683	330	170	157	-372
Max.	3163	3163	3163	3163	3163	3163	3470	3538	3538	3538	3351	240	

Table C-6. CALSIM-Simulated Feather River Releases (cfs) below Thermalito Afterbay Reservoir for the 2001 No Action Conditions and changes for the 2020 No Action Conditions

Year	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Annual Total (taf)	2020 minus 2001
1922	1996	2500	3488	1708	5364	4801	1204	16669	6460	3449	6552	1008	3340	170
1923	1708	1697	7479	4932	1693	3608	1888	1688	3519	6220	6381	1008	2545	221
1924	1907	2500	4684	1708	1634	3108	2238	2002	5234	4531	3497	2522	2152	-71
1925	1455	908	1249	894	900	2648	756	748	1738	1423	6459	756	1212	-346
1926	1282	908	1843	894	900	748	756	4086	5069	6558	5068	2933	1884	-53
1927	3493	907	4119	894	8481	7113	4666	3879	4387	3720	6921	1008	2977	227
1928	1708	1697	2764	1708	3517	24997	1008	2786	5816	4015	7113	2767	3640	-13
1929	2650	2128	1708	1708	1693	1708	756	2141	2945	1835	1790	2051	1395	-44
1930	1477	1875	2105	894	2829	748	1156	1010	4569	7224	5865	2007	1917	34
1931	894	1521	2038	894	900	748	2663	2076	3829	7411	4172	2645	1805	-55
1932	2256	1396	4386	894	869	1986	776	748	2097	1371	6330	1433	1493	-75
1933	1859	2500	894	894	900	4789	756	748	1910	1747	1514	1288	1199	-43
1934	1221	908	2490	894	2597	748	2752	2435	3272	2649	3151	3741	1615	69
1935	2599	908	894	894	900	748	1008	2689	7859	7779	6763	1867	2118	53
1936	4000	2500	2735	1708	1634	3201	1008	992	5118	5762	6782	1172	2222	144
1937	4000	2500	2738	1708	1693	1708	1008	992	2507	7665	7402	1816	2172	-193
1938	1708	1697	2830	5326	14537	19405	13027	17147	8059	2016	5615	1008	5546	92
1939	3218	2920	3347	3743	2675	4827	2138	3737	5037	8400	7964	4109	3160	-33
1940	4000	2500	1463	1203	1165	14420	3765	2332	5949	9170	7225	1008	3300	325
1941	2202	2500	1708	4836	17639	11474	3745	8413	2933	1969	4688	1008	3756	89

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Year	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Annual Total (taf)	2020 minus 2001
1942	2698	3180	18971	14374	17643	2809	10495	5682	5811	2452	5928	1008	5453	-331
1943	1708	4744	8734	18784	7503	16104	4122	1015	5505	5223	6557	1008	4906	-109
1944	1708	1697	2005	1708	1634	2641	1461	992	6385	8006	7195	3924	2383	-43
1945	3517	1697	1708	1708	1693	1708	1008	992	6509	8403	6738	1008	2226	142
1946	1708	1697	1708	4657	4372	6480	1008	1508	6681	8832	7876	3444	3021	-50
1947	3208	2451	1708	1708	1693	1708	1657	1709	3536	8044	7608	2193	2259	-64
1948	1880	1619	1727	1203	1829	992	1008	992	1008	8270	7239	1310	1767	99
1949	2359	2500	1708	1708	1693	1708	756	748	5061	4081	4451	756	1665	2
1950	996	908	894	894	900	748	1008	2283	8077	8895	7416	1008	2065	10
1951	1708	1697	14103	11690	10855	4548	1008	1465	1968	8496	6785	1822	3990	118
1952	2721	1697	4591	8931	12157	7114	17416	20073	8835	2179	992	3562	5416	-141
1953	4882	2843	9108	21023	1693	6196	4477	3162	5480	5217	5314	1008	4292	139
1954	1708	2418	3036	9809	8589	10161	6136	5594	4809	7459	6739	3269	4203	-27
1955	4000	1697	1708	1708	1693	1708	1008	992	4941	3478	1514	1009	1538	13
1956	1708	1728	8835	21006	11356	6456	3155	10718	5767	4658	6089	1008	4981	-46
1957	1708	1697	1823	4266	15935	6948	3913	992	6185	6193	4597	2478	3365	-174
1958	1708	1728	1708	1708	21911	11941	7656	10426	6632	1673	992	2905	4197	96
1959	4898	2832	3368	9999	9584	2277	1382	2840	7225	8771	7255	3505	3845	-113
1960	4000	2500	2753	1203	1165	992	2073	992	4118	6019	3357	1039	1831	193
1961	1203	1193	1318	1203	1206	1077	2141	1432	4230	6622	7571	2969	1950	-196
1962	3666	2500	894	894	900	748	756	1597	7646	7391	7275	3945	2315	-6
1963	1203	1193	1203	1919	10932	8333	13084	3028	7436	3743	6446	1008	3550	3

Table C-6. Continued

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Year	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Annual Total (taf)	2020 minus 2001
1964	1708	1697	1708	1708	1634	2125	6069	1103	4577	8130	7524	5026	2600	36
1965	3567	1697	3394	19181	4873	5289	7640	5236	1008	5831	5919	1008	3923	-71
1966	1708	2779	3645	3528	1802	4332	1041	4093	5668	8331	7213	3207	2876	90
1967	4000	1697	1708	1708	4442	14438	2135	9064	8415	1399	992	3111	3209	-48
1968	5202	2786	3654	8143	11793	6663	4474	992	4798	6383	6921	3377	3907	2
1969	4000	1835	1708	11303	12487	6492	7440	12633	3593	1721	1082	5382	4174	19
1970	3376	3827	16401	35878	10669	4151	3236	992	5013	6851	6030	3740	6064	13
1971	2793	1697	1708	1708	1693	13051	3625	8387	5417	8236	6091	1008	3374	59
1972	1708	2251	1708	3738	6577	6851	1008	992	4222	5789	5986	1331	2536	-24
1973	1708	1697	1708	8153	10124	6138	1008	2315	7128	4689	5848	1008	3086	43
1974	1708	5894	10226	20570	5792	26293	8329	5576	6807	1348	2687	1008	5839	-141
1975	3939	3505	2863	2965	13235	12932	1008	8077	5996	3355	2933	1008	3699	129
1976	3459	3926	4004	3626	3988	3512	1008	1116	2271	6797	5385	3911	2598	-153
1977	2474	2500	2445	1203	1672	1195	1321	1275	3491	4564	2785	1491	1597	-186
1978	1387	908	894	894	900	748	1008	992	2585	1453	6674	1008	1180	241
1979	1340	1223	1203	2633	11708	4447	1144	992	7497	5488	5985	1008	2655	14
1980	1708	1697	1708	14747	18152	5342	1008	992	4098	1585	5512	1008	3416	-120
1981	1708	1697	1708	2042	3715	6985	1008	992	4846	6766	6533	2840	2468	204
1982	4000	1193	15473	8343	17997	13436	18983	7930	3609	992	4551	1008	5840	8
1983	6208	8703	11001	12697	21736	31845	8745	11832	11636	2756	1416	5080	8021	-80
1984	5077	14569	24345	5612	8609	9047	1410	992	5029	6774	5910	3534	5490	163
1985	1708	1697	1708	1711	1693	3959	1008	3577	4784	8263	6955	4300	2510	-84

Table C-6. Continued

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Year	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Annual Total (taf)	2020 minus 2001
1986	4000	2500	1708	1708	21211	23088	1008	992	4170	3764	5893	1008	4225	-64
1987	1708	1697	1708	1708	1693	2280	3467	1069	5269	7386	6579	3819	2322	-11
1988	4000	2500	1203	1203	1165	1268	756	2091	2557	3346	2214	1698	1454	-18
1989	2197	908	894	894	900	748	756	1782	5431	8106	7403	2090	1951	24
1990	3389	2500	4585	894	2599	748	1343	748	832	3295	2655	901	1479	-119
1991	1800	2276	1560	894	900	748	756	748	1492	2697	1905	1570	1049	-15
1992	907	2283	1000	894	869	748	756	1784	1486	1883	1828	2876	1045	-50
1993	1616	1191	894	894	900	10728	3466	7620	4283	3554	6922	1072	2627	291
1994	1203	1436	1961	2053	5626	1145	1008	992	4025	11226	7226	4527	2554	-131
Avg.	2546	2328	3822	4982	5899	6133	3161	3624	4852	5230	5353	2155	3020	0
Min.	894	907	894	894	869	748	756	748	832	992	992	756	1045	-346
Max.	6208	14569	24345	35878	21911	31845	18983	20073	11636	11226	7964	5382	8021	325

Table C-7. CALSIM-Simulated Folsom Storage (taf) for the 2001 No Action Conditions and Changes in Carryover Storage for 2020 No action Conditions

Year	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	2020 minus 2001 (taf)
1922	510	520	575	575	575	674	800	975	975	825	774	650	-6
1923	631	575	575	575	575	572	800	975	975	818	747	650	-14
1924	625	575	533	489	517	393	404	399	349	282	259	239	-33
1925	255	291	334	341	561	483	745	975	857	671	540	493	18
1926	462	432	418	402	575	612	800	754	576	436	423	431	-86
1927	384	522	575	575	562	661	800	975	975	802	759	650	-8
1928	633	575	556	552	575	638	800	913	850	600	507	447	32
1929	412	407	408	389	440	526	545	605	571	477	401	381	-1
1930	365	362	490	566	572	672	780	782	703	525	473	516	-6
1931	403	350	279	297	338	399	385	410	387	337	310	282	-37
1932	212	227	348	454	575	627	684	905	917	763	588	473	-73
1933	371	289	295	317	332	395	363	472	471	378	352	348	-10
1934	310	300	389	490	574	633	541	511	410	342	291	275	-76
1935	237	297	331	443	518	634	800	949	975	799	644	598	-69
1936	553	528	509	575	570	667	800	975	975	817	717	650	-30
1937	588	547	514	492	575	675	800	975	928	740	630	582	-47
1938	579	575	575	575	575	674	800	975	975	864	800	650	0
1939	636	575	519	485	485	573	622	639	562	423	346	351	-35
1940	345	338	341	572	559	618	800	975	924	723	690	646	-73
1941	600	575	575	575	574	672	800	975	975	808	770	650	-1

Table C-7. Continued

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													2020 minus 2001
1942	634	575	575	572	563	633	800	975	975	858	800	650	0
1943	629	575	575	565	537	618	800	957	971	807	771	650	-12
1944	600	575	536	521	575	675	654	718	650	531	537	478	-60
1945	453	545	575	559	565	659	756	975	923	744	719	650	-46
1946	601	575	575	571	527	630	800	975	875	678	649	606	-73
1947	547	492	471	426	496	653	649	621	600	467	402	326	-29
1948	375	415	404	484	423	477	800	975	975	807	750	650	-15
1949	626	575	546	516	534	675	800	956	803	600	585	537	-136
1950	482	427	386	575	572	672	800	975	975	808	759	650	0
1951	600	382	305	320	341	587	800	975	912	685	646	552	-72
1952	547	550	575	575	574	674	800	975	975	924	784	650	0
1953	648	575	575	574	568	646	788	963	975	874	800	650	0
1954	629	575	523	544	575	672	800	842	734	494	450	396	-90
1955	403	408	489	575	511	504	567	626	569	478	477	505	-58
1956	446	425	531	393	391	534	714	975	975	845	800	650	0
1957	649	575	519	490	571	667	674	962	906	711	600	552	-45
1958	551	562	575	575	565	671	800	975	975	843	769	650	0
1959	625	575	515	575	575	590	634	595	515	270	243	261	-57
1960	274	278	277	319	575	669	681	705	600	477	420	415	-16
1961	381	393	400	376	428	457	480	490	478	222	176	202	-65
1962	212	222	255	276	575	624	800	885	862	646	600	545	-116
1963	720	575	575	554	475	589	887	975	975	787	741	650	-30

Table C-7. Continued

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													2020 minus 2001
1964	641	575	537	575	547	544	609	680	633	502	439	381	-29
1965	381	448	364	360	377	517	806	953	975	825	800	633	-35
1966	600	575	533	551	575	564	706	691	600	395	369	321	-96
1967	334	406	575	571	560	642	800	975	975	950	800	650	0
1968	643	575	532	550	647	650	707	690	600	336	368	393	-56
1969	404	459	556	550	535	645	800	975	975	831	661	622	28
1970	619	575	575	387	380	594	618	727	673	472	438	393	7
1971	400	544	575	575	534	663	765	975	975	831	792	650	0
1972	619	575	575	575	575	660	768	866	658	446	435	474	-70
1973	456	524	575	567	563	669	778	975	809	600	600	568	-66
1974	575	575	575	495	480	606	800	975	975	856	800	650	0
1975	632	575	558	566	575	674	758	975	975	828	795	650	0
1976	679	575	506	435	411	424	453	478	434	374	353	332	-62
1977	333	316	246	238	227	228	220	219	141	109	97	97	15
1978	97	118	267	569	557	623	800	975	975	815	760	650	-34
1979	600	575	539	575	575	672	745	975	782	600	600	549	-75
1980	550	575	575	433	390	602	780	962	975	837	800	650	-17
1981	600	575	527	536	571	674	654	616	560	351	301	305	-80
1982	348	549	370	392	338	581	800	975	975	851	800	650	0
1983	720	573	573	564	551	622	800	975	975	950	800	650	0
1984	720	377	329	338	360	589	760	975	948	765	721	635	15
1985	625	575	569	529	574	651	745	743	600	464	403	379	-42

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													2020 minus 2001
1986	380	449	551	559	357	570	800	975	975	788	747	650	0
1987	600	575	522	497	552	635	644	602	516	420	360	362	-35
1988	344	349	400	486	443	444	433	354	307	213	130	148	0
1989	170	274	321	343	398	611	800	846	649	486	402	448	-28
1990	459	402	341	335	359	444	462	487	464	396	380	383	-22
1991	360	355	313	269	260	471	578	644	699	571	508	399	-44
1992	334	294	292	287	477	559	554	457	389	290	187	172	-81
1993	177	176	263	571	555	621	800	975	975	869	796	650	0
1994	641	554	480	401	405	415	433	487	477	254	229	215	-21
Avg.	490	471	471	484	505	592	703	813	769	620	564	501	-32
Min.	97	118	246	238	227	228	220	219	141	109	97	97	-136
Max.	720	575	575	575	647	675	887	975	975	950	800	650	32

Table C-8. CALSIM-Simulated Nimbus Dam Releases (cfs) for the 2001 No Action Conditions and Change for 2020 No Action Conditions

Year	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Annual	2020
													Total	minus 2001
1922	1500	1200	2028	2074	6311	3417	4552	9586	9613	5000	2500	3661	3088	-186
1923	1750	2897	6919	4597	3106	3000	3454	4665	3095	5000	2891	3422	2710	-173
1924	1762	1835	1651	1500	1125	2628	750	1000	1500	1750	1000	1009	1060	-44
1925	750	800	1000	1000	5121	5000	3000	3762	5000	5000	3872	2500	2210	-268
1926	1954	1943	1749	1312	1423	1500	2829	2250	3700	3032	1114	1000	1437	-9
1927	1908	1526	2086	3652	13471	4624	7865	4876	5568	5000	2500	3643	3371	-248
1928	1750	3663	2700	2025	1892	12821	4849	2596	2174	5000	2992	2500	2727	-217
1929	1500	1200	1300	1200	900	750	2134	1437	2377	2466	2348	1468	1154	-105
1930	1089	875	1300	1200	2229	2865	1750	2250	2789	3967	2566	1000	1442	-122
1931	2883	2307	2076	750	500	750	1449	1000	1703	1793	1003	1195	1054	-60
1932	1931	800	1000	1000	3409	3000	3000	3000	5000	5000	4645	3602	2131	-148
1933	2934	2557	1000	750	750	1208	3175	1412	3042	2582	2135	1223	1376	-178
1934	1756	1405	1000	1000	1100	1631	3272	1327	2377	1750	1000	1015	1123	-30
1935	1661	800	1000	1000	1298	1500	8118	4763	4149	5000	4296	2500	2180	-184
1936	2278	1823	1640	5650	13556	4209	5627	4138	5000	5000	3476	2898	3289	-194
1937	2343	1875	1687	1500	4418	4470	4415	4103	3227	5000	3592	2500	2356	-153
1938	1500	1838	6745	2868	9817	11086	8033	9752	9091	5000	3084	4410	4398	-232
1939	1750	2582	2324	1743	1307	1500	1750	1000	2125	3022	1624	1000	1313	-101
1940	1248	1170	1300	3428	10589	10912	6083	3309	3000	5000	2317	2500	3039	-145
1941	2086	1921	4840	5806	8078	4894	3802	5134	3547	5000	2500	3838	3089	-259

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													Annual Total	2020 minus 2001
1942	1750	2747	5630	9287	10054	3000	5540	6772	7534	5000	2973	4379	3876	-183
1943	1750	4470	4778	10841	7258	12601	5046	3000	3000	5000	2500	3832	3864	-178
1944	2213	1628	1894	1500	1700	1970	3000	2250	3026	3398	1694	2500	1616	-97
1945	1500	1242	2149	2046	9029	2250	3000	2853	3790	5000	2163	2855	2254	-189
1946	2542	3635	8925	5201	3289	3000	3305	3791	3909	5000	2252	2500	2865	-157
1947	2374	3187	2429	1822	1366	1500	3000	2250	1619	2985	2424	2500	1660	-193
1948	750	800	1300	1200	2230	1528	1991	3780	5416	5000	2705	3390	1814	-176
1949	1750	2357	2121	1591	1350	3079	3463	3000	4314	4476	1970	2500	1933	-58
1950	1947	2105	1894	1938	5641	3151	4814	4189	4246	5000	2585	3602	2465	-308
1951	2733	16727	16253	10362	8371	3828	3254	3818	3000	5000	2500	2949	4744	-108
1952	1500	2442	5503	9069	9639	6228	8829	11546	10697	5000	4749	4368	4783	-256
1953	1750	2876	2650	7269	2385	1789	3000	3000	6286	5000	3283	4348	2636	-188
1954	1750	2971	2674	2005	2829	4439	4490	3041	3113	5000	2500	2500	2251	-64
1955	750	1150	1300	1218	2903	2225	1750	3000	3000	2710	1806	1000	1372	-165
1956	1977	1581	16240	16591	6360	3000	3000	5567	6102	5000	2767	4338	4392	-238
1957	1750	2707	2436	1827	2936	4503	3000	2250	4057	5000	3582	2500	2205	-138
1958	1500	1200	2177	2936	10140	6739	10416	10164	7967	5000	3330	3886	3918	-227
1959	1750	2328	2095	1609	3365	2250	1750	2250	2378	4700	1000	1000	1593	-84
1960	750	800	1000	750	1267	4012	3436	2250	3056	2829	2307	1433	1444	-173
1961	1500	1200	1300	1200	900	1500	1750	2250	1500	4700	1000	532	1173	-74
1962	750	800	1000	750	1551	3000	3063	3000	3000	5000	2328	2500	1617	-107
1963	3331	4375	3445	3985	11887	2250	4700	8655	3431	5000	2500	3373	3398	-260

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													Annual Total	2020 minus 2001
1964	1750	4917	2700	2069	2264	1767	1750	2250	2799	3251	2777	2500	1856	-146
1965	957	800	21220	13120	5555	2250	4700	4240	3460	5000	2530	4680	4153	-163
1966	2044	2673	2678	2008	1506	3000	1750	2250	2180	3918	1635	1878	1666	-91
1967	750	800	2124	6887	4489	6142	4010	8548	10703	4224	4498	4586	3485	-273
1968	1750	3271	2700	2025	4700	3691	1750	2250	2418	5000	1041	1000	1898	-101
1969	750	1337	1300	16232	9315	3799	6570	9322	6830	5000	4671	2500	4069	-261
1970	1750	2452	5654	21102	6318	2417	3000	2250	3000	5000	2204	2500	3485	-148
1971	750	1150	5681	4814	4055	3490	3302	3154	5204	5000	2500	4041	2601	-158
1972	1923	2601	2868	2151	3047	4166	1750	2250	5000	4687	1683	1000	1998	-84
1973	1500	1200	3012	9337	7204	3505	3000	4063	4950	4953	1731	2500	2821	-182
1974	1500	6731	7367	11740	4589	9385	6278	4944	4406	5000	2990	4485	4197	-250
1975	1750	2325	2092	1569	4155	4664	3000	4643	6516	5000	2500	4183	2550	-189
1976	1750	3899	2700	2025	1519	1139	750	1000	1500	1750	1000	1000	1209	-9
1977	750	800	1300	500	500	350	368	500	1500	467	371	409	471	-102
1978	492	437	525	2810	4900	6085	4064	4411	4702	5000	2500	3700	2382	-245
1979	1922	1877	1849	2353	3698	3431	3000	3500	5000	4528	1633	2500	2123	-124
1980	1500	1484	2296	18252	13496	3607	3000	3000	3226	5000	2589	4273	3691	-237
1981	2230	1939	2190	1642	1350	1668	3000	2250	1500	4172	1500	1000	1480	-83
1982	750	3945	14422	8229	15420	7697	14459	9528	6360	5000	2876	4784	5597	-257
1983	2136	8058	9229	7652	12469	16481	6595	10629	14668	6194	5168	5274	6286	-180
1984	1751	15897	15134	6758	5884	2586	2532	2446	3000	5000	2500	3257	4020	-182
1985	1750	4558	2700	2030	1519	1500	3000	2250	3343	2969	2515	1775	1805	-70

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													Annual Total	2020 minus 2001
1986	1022	818	1300	4596	32947	11119	2734	2962	3529	5000	2500	3679	4222	-217
1987	2407	1528	1985	1500	1125	1500	1750	1730	1978	1947	1201	1191	1201	-70
1988	1140	912	1300	1200	2043	1500	1750	2250	1500	1750	1500	448	1042	-113
1989	497	437	1000	1000	750	7705	3829	3475	5000	3719	3006	1115	1914	-179
1990	1500	2517	2236	1677	1258	1500	2074	1000	1770	1800	1509	1131	1206	-122
1991	974	800	1300	1000	500	750	1750	2250	1500	3672	2376	2500	1175	-102
1992	2048	1638	1000	750	500	1500	2090	2250	1500	1750	1762	517	1050	-34
1993	460	482	500	3045	6145	7737	4106	5483	5636	5000	2712	4049	2724	-287
1994	1750	3963	2700	2025	1519	1500	1750	1000	1751	4717	1000	1000	1491	-80
Avg.	1626	2529	3556	4125	4953	3935	3684	3782	4095	4200	2429	2591	2497	-156
Min.	460	437	500	500	500	350	368	500	1500	467	371	409	471	-308
Max.	3331	16727	21220	21102	32947	16481	14459	11546	14668	6194	5168	5274	6286	-9

Table C-9. CALSIM-Simulated New Melones Storage (taf) for the 2001 No Action Conditions and Change in Carryover storage for 2020 No Action Conditions

Year	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	2020 minus 2001 carryover (taf)
1922	998	1012	1044	1083	1192	1262	1233	1406	1694	1642	1543	1438	1
1923	1422	1438	1504	1570	1623	1657	1637	1726	1792	1732	1626	1529	0
1924	1524	1526	1542	1558	1570	1572	1512	1423	1372	1284	1215	1146	-1
1925	1133	1141	1158	1181	1318	1398	1399	1505	1589	1541	1451	1363	-1
1926	1352	1359	1369	1377	1447	1491	1503	1448	1399	1280	1190	1100	-2
1927	1102	1123	1181	1234	1373	1447	1490	1545	1672	1599	1510	1425	-1
1928	1418	1454	1482	1500	1549	1718	1691	1710	1694	1592	1491	1400	2
1929	1395	1405	1417	1427	1444	1452	1412	1368	1336	1236	1162	1077	-3
1930	1075	1084	1098	1125	1166	1227	1226	1169	1183	1077	992	898	-4
1931	903	923	936	955	974	990	953	879	846	767	705	659	-4
1932	648	661	711	751	830	882	883	1031	1199	1162	1087	995	-4
1933	995	1004	1026	1046	1063	1077	1042	1000	1044	953	858	765	-4
1934	795	801	824	854	895	941	901	824	772	704	629	576	-5
1935	568	575	589	628	660	710	761	951	1097	1034	954	859	-5
1936	854	868	884	966	1143	1226	1307	1454	1562	1493	1407	1316	4
1937	1312	1326	1346	1375	1473	1567	1541	1663	1740	1655	1564	1463	-5
1938	1451	1458	1540	1620	1802	2009	2099	2372	2420	2410	2303	2194	0
1939	1970	1951	1954	1969	1970	1994	1923	1779	1712	1582	1452	1344	0
1940	1331	1332	1340	1443	1581	1738	1777	1889	1931	1831	1727	1624	4

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Year	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	2020 minus 2001 carryover (taf)
1941	1610	1619	1657	1710	1797	1895	1852	1988	2083	2021	1918	1805	4
1942	1786	1786	1826	1915	1970	2025	2033	2152	2334	2281	2166	2052	0
1943	1970	1965	1964	1970	1970	2030	2098	2143	2194	2100	1989	1869	0
1944	1848	1845	1843	1847	1862	1899	1804	1725	1731	1622	1499	1393	3
1945	1385	1423	1451	1491	1623	1697	1657	1732	1853	1778	1664	1563	7
1946	1551	1579	1663	1728	1786	1835	1838	1909	1931	1827	1719	1625	1
1947	1614	1636	1656	1672	1699	1745	1693	1622	1569	1443	1341	1249	-3
1948	1249	1250	1254	1265	1278	1305	1311	1345	1492	1428	1348	1262	0
1949	1260	1276	1292	1311	1333	1380	1370	1402	1426	1338	1251	1162	5
1950	1153	1154	1167	1224	1298	1360	1370	1487	1594	1522	1437	1343	3
1951	1334	1609	1965	1970	1970	2030	1993	1981	1970	1874	1777	1675	0
1952	1659	1675	1728	1867	1959	2030	2056	2359	2420	2420	2326	2208	0
1953	1970	1956	1964	1970	1970	2008	1938	1857	1958	1897	1791	1689	1
1954	1672	1683	1696	1712	1738	1804	1790	1833	1827	1722	1615	1513	1
1955	1502	1513	1532	1564	1588	1618	1572	1529	1545	1433	1337	1236	0
1956	1235	1247	1491	1751	1881	1969	1949	2074	2215	2142	2029	1928	3
1957	1906	1914	1925	1940	1970	2030	1921	1904	1972	1878	1779	1669	0
1958	1626	1640	1646	1696	1774	1917	1990	2264	2420	2374	2261	2136	0
1959	1970	1959	1963	1970	1970	2005	1912	1760	1700	1575	1450	1347	1
1960	1331	1337	1344	1353	1397	1453	1431	1363	1324	1213	1132	1028	2
1961	1001	1024	1046	1061	1080	1104	1072	1012	963	888	819	736	0

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Year	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	2020 minus 2001 carryover (taf)
1962	742	767	788	800	857	905	922	957	1049	989	904	808	6
1963	808	828	856	918	1057	1114	1119	1329	1464	1410	1330	1247	4
1964	1244	1279	1304	1348	1381	1412	1380	1325	1313	1205	1125	1025	5
1965	1018	1045	1283	1488	1603	1670	1707	1782	1909	1867	1782	1683	1
1966	1662	1694	1725	1763	1797	1837	1776	1723	1681	1575	1474	1372	3
1967	1362	1376	1460	1565	1635	1743	1761	1955	2272	2306	2202	2088	3
1968	1970	1958	1962	1970	1970	2012	1915	1824	1773	1643	1510	1390	1
1969	1382	1410	1423	1704	1904	2030	2152	2420	2420	2410	2295	2162	0
1970	1970	1962	1964	1970	1970	2030	1952	1948	1991	1883	1770	1672	2
1971	1659	1688	1753	1811	1857	1913	1839	1826	1918	1834	1723	1624	2
1972	1605	1624	1672	1709	1736	1793	1715	1693	1647	1522	1397	1288	0
1973	1283	1292	1321	1436	1580	1687	1645	1760	1834	1741	1639	1544	0
1974	1537	1584	1660	1776	1857	1997	2045	2166	2225	2131	2017	1901	8
1975	1886	1894	1909	1934	1970	2030	1973	1998	2167	2083	1975	1858	0
1976	1846	1861	1872	1879	1895	1910	1831	1720	1646	1538	1428	1336	-2
1977	1329	1336	1337	1332	1329	1322	1262	1178	1155	1081	1013	938	-2
1978	912	908	931	1011	1102	1248	1300	1426	1579	1553	1470	1400	0
1979	1388	1402	1421	1494	1616	1741	1706	1826	1852	1751	1651	1553	2
1980	1549	1564	1576	1886	1970	2030	2036	2081	2191	2146	2032	1918	0
1981	1915	1916	1928	1970	1970	2004	1925	1796	1714	1581	1458	1361	1
1982	1356	1415	1548	1738	1970	2030	2214	2347	2420	2396	2294	2207	0

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Year	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	2020 minus 2001 carryover (taf)
1983	1970	1970	1970	1970	1970	2030	2033	2167	2420	2420	2393	2270	0
1984	1970	1970	1970	1970	1970	2030	1950	1946	1959	1869	1771	1685	0
1985	1678	1716	1754	1770	1809	1852	1809	1751	1641	1516	1397	1301	-1
1986	1302	1318	1340	1422	1892	2030	2032	2058	2129	2019	1916	1822	0
1987	1813	1820	1827	1823	1828	1850	1777	1646	1575	1473	1386	1313	-2
1988	1296	1287	1284	1292	1305	1322	1272	1196	1167	1103	1058	974	-2
1989	958	946	942	949	968	1058	1044	1005	992	903	841	768	-3
1990	796	809	832	853	880	914	864	772	743	659	604	560	-4
1991	556	561	582	587	594	639	579	551	550	475	413	377	-1
1992	391	399	423	441	495	543	500	432	363	299	225	190	2
1993	186	188	212	361	468	635	652	799	892	905	838	761	-2
1994	800	828	869	910	940	965	904	832	775	706	634	592	-15
Avg.	1356	1372	1407	1459	1522	1587	1569	1600	1644	1566	1472	1379	0
Min.	186	188	212	361	468	543	500	432	363	299	225	190	-15
Max.	1970	1970	1970	1970	1970	2030	2214	2420	2420	2420	2393	2270	8

Table C-10. CALSIM-Simulated Stanislaus River Flows (cfs) below Goodwin Dam for the 2001 No Action Conditions and Changes for 2020 No Action Conditions

Year	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Annual Total (taf)	2020 minus 2001 (taf)
1922	354	303	303	137	389	278	970	1466	222	327	433	240	328	-1
1923	494	369	369	278	278	304	1245	1218	298	347	431	254	356	-1
1924	503	313	313	304	304	133	496	505	584	626	267	240	277	2
1925	354	298	298	133	295	236	753	881	222	263	274	240	256	1
1926	431	246	246	236	236	134	585	602	445	683	296	240	265	1
1927	354	209	209	134	288	274	940	1466	222	263	267	240	294	0
1928	491	282	282	274	274	269	940	1344	222	317	342	240	319	-2
1929	481	269	269	269	269	133	492	596	585	661	267	240	274	6
1930	354	216	216	133	133	130	455	593	606	670	267	240	243	2
1931	354	211	211	130	130	124	414	408	473	533	267	240	211	0
1932	218	198	198	124	124	131	439	585	222	263	267	240	182	0
1933	354	214	214	131	131	127	399	548	317	413	449	240	214	0
1934	110	210	210	127	127	124	380	411	472	526	267	240	194	2
1935	123	198	198	124	124	129	416	463	222	263	267	240	167	1
1936	354	263	263	129	683	160	628	737	222	263	267	240	252	-11
1937	363	248	248	160	349	279	986	1449	222	263	267	240	307	8
1938	494	370	370	279	570	401	1500	1500	3554	628	527	401	637	-5
1939	4216	491	491	401	645	287	1071	1355	861	993	984	489	746	0
1940	494	287	287	287	326	1365	1351	535	353	428	276	379	-4	
1941	546	334	334	326	326	356	1500	1500	803	342	416	313	429	0

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Year	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Annual Total (taf)	2020 minus 2001 (taf)
1942	594	447	447	356	759	401	1500	1500	825	628	527	401	505	4
1943	1781	785	878	2697	2265	3438	1500	1500	825	628	527	401	1039	0
1944	594	491	491	401	401	286	1068	1359	507	661	707	371	444	-3
1945	507	286	286	286	286	319	1329	1311	464	494	582	269	388	-1
1946	533	358	358	319	319	331	1396	1385	595	494	536	281	417	5
1947	557	331	331	331	331	207	749	769	777	878	523	240	364	5
1948	406	330	330	207	207	137	488	602	222	263	320	240	227	-1
1949	354	234	234	137	137	135	495	633	243	391	407	240	221	-4
1950	354	210	210	135	146	204	699	686	222	285	318	240	224	3
1951	402	317	845	1946	2034	952	1450	1445	702	291	291	291	657	3
1952	576	341	341	344	341	1255	1500	1500	2840	628	527	401	639	0
1953	4237	491	620	1236	1067	341	1450	1445	702	438	475	291	774	-1
1954	576	341	341	341	372	303	1236	1208	283	472	496	253	376	-2
1955	500	311	311	303	303	148	600	563	595	755	476	240	309	2
1956	354	314	520	366	148	399	1500	1500	825	619	521	398	452	-1
1957	594	399	399	399	532	344	1418	1410	639	337	411	285	432	2
1958	565	335	335	335	335	401	1500	1500	825	628	527	401	465	0
1959	3185	491	491	652	1331	290	1109	1313	797	904	882	524	722	0
1960	531	290	290	290	290	133	459	639	661	684	267	240	289	-1
1961	354	216	216	133	133	124	468	490	708	368	267	240	224	0
1962	353	198	198	124	124	127	405	683	222	291	313	240	199	-5
1963	354	202	202	127	127	136	484	627	222	263	267	240	197	3

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Year	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Annual Total (taf)	2020 minus 2001 (taf)
1964	354	219	219	136	136	133	453	599	542	669	267	240	240	0
1965	354	216	344	261	133	334	1409	1399	621	284	284	284	358	1
1966	561	377	377	334	334	272	940	1431	320	444	456	240	369	-3
1967	488	272	272	272	272	401	1500	1500	825	628	527	401	445	0
1968	2387	491	491	582	1467	298	1196	1217	760	886	868	504	671	2
1969	547	298	298	298	392	768	1500	1869	3398	628	527	401	658	1
1970	3716	491	1194	4762	2558	1095	1467	1464	736	400	427	294	1123	-2
1971	582	344	344	344	344	331	1395	1384	594	501	534	281	422	-1
1972	557	331	331	331	331	268	1001	1318	760	835	819	455	444	1
1973	480	359	359	268	321	302	1230	1202	270	263	330	252	341	-1
1974	498	348	348	302	302	386	1500	1500	956	533	461	372	453	-8
1975	594	477	477	386	908	1167	1500	1500	817	525	456	369	553	8
1976	594	476	476	385	385	244	834	984	733	799	805	240	421	2
1977	438	257	257	244	244	209	549	682	678	303	267	240	264	0
1978	354	213	213	212	174	253	798	818	222	263	273	240	244	-2
1979	449	344	344	253	253	304	1241	1213	291	265	315	254	334	-1
1980	501	384	384	310	3266	989	1500	1500	825	628	527	401	664	1
1981	594	491	491	419	559	292	1125	1295	756	880	857	494	498	-1
1982	517	292	292	292	1724	3086	1500	1500	825	628	527	401	696	1
1983	5247	2363	2922	4059	4744	5486	1500	1500	3964	2406	681	1027	2162	0
1984	5843	3139	4690	2538	2376	1359	1499	1499	798	506	568	300	1519	0
1985	594	350	350	350	350	274	940	1481	730	878	883	475	464	1

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Year	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Annual Total (taf)	2020 minus 2001 (taf)
1986	492	282	282	274	274	3650	1500	1500	825	628	527	401	646	-1
1987	594	491	491	401	401	234	790	973	778	839	707	240	420	2
1988	430	254	254	234	234	150	486	489	647	517	267	240	254	1
1989	354	295	295	129	129	127	404	435	592	624	267	240	235	1
1990	254	293	293	127	127	124	396	411	520	448	267	240	212	1
1991	159	198	198	124	124	124	380	368	312	367	267	240	173	-3
1992	109	226	198	124	124	124	380	368	460	263	267	240	174	-2
1993	109	198	198	124	124	125	383	371	222	263	267	240	159	0
1994	125	291	291	125	125	124	545	450	416	516	267	240	212	14
Avg.	802	388	441	474	564	517	967	1058	701	535	441	309	435	0
Min.	109	198	198	124	124	124	380	368	222	263	267	240	159	-11
Max.	5843	3139	4690	4762	4744	5486	1500	1869	3964	2406	984	1027	2162	14

Table C-11. CALSIM-Simulated Sacramento River Flows (cfs) at Freeport for the 2001 No Action Conditions and Changes for 2020 No Action Conditions

Year	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Annual Total (taf)	2020 minus 2001 (taf)
1922	10208	9995	17344	16163	35611	29474	23013	47507	36023	18795	15315	13796	16425	85
1923	10611	13252	31101	28615	14716	13973	23083	16697	14718	19413	15296	13037	12975	206
1924	10259	10381	12098	12694	15597	10000	7627	6921	10910	10284	10023	6993	7448	-2
1925	7611	7983	12653	12273	64650	26975	20893	14400	13621	12408	16115	11305	13091	-395
1926	9134	8508	8766	17102	39592	13427	19607	12342	12675	15640	10407	11009	10619	125
1927	10284	23278	18813	30933	74842	42845	45467	25625	20604	17384	15963	13330	20218	-24
1928	10061	19677	15398	22503	23983	74278	26003	15156	13746	17446	17232	13941	16278	17
1929	10741	12322	11901	12836	15499	10764	7135	7742	10121	11855	8619	8054	7678	-46
1930	7771	7234	17820	21828	18556	31551	11933	11801	12966	16347	13818	11282	11050	-55
1931	9156	9395	9625	12748	10076	7431	8595	7279	10431	16026	10482	7042	7143	15
1932	7757	7094	18906	20574	17210	13252	9487	12998	14234	11316	15817	11887	9684	-64
1933	9021	8515	8338	12944	11018	13194	10468	6578	10127	11227	8386	7157	7055	94
1934	7767	7233	13965	19414	14586	12594	11541	7769	11151	10858	7785	8624	8032	53
1935	7765	10871	9849	28809	13794	25640	48413	23471	21271	18061	16517	12094	14280	121
1936	12130	9615	10665	38967	60971	29925	20745	14985	18581	17855	16038	11970	15654	119
1937	11960	9525	11438	12754	35192	38990	22059	15882	12888	17410	16265	11751	12968	-153
1938	9688	24091	61698	31007	74258	74621	60264	55480	34822	16641	15429	16566	28469	-136
1939	15638	12375	14654	13396	11486	13496	9167	10638	14551	19035	15451	12624	9828	15
1940	10809	8654	10157	33273	55701	73756	65007	18777	16636	21837	15885	12383	20548	127
1941	10099	12164	42837	73171	73782	70346	60807	39037	16687	18121	15244	17676	27016	262

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Year	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Annual Total (taf)	2020 minus 2001 (taf)
1942	13594	13587	64264	68839	74385	22644	42905	34041	26552	17580	15363	15567	24530	-400
1943	13273	17167	28607	71802	51448	67083	25534	18272	16622	17910	15708	13415	21491	-147
1944	10532	9569	11101	13978	23958	20402	10501	10338	15651	18991	15381	14636	10520	45
1945	10377	14095	17109	13503	46055	22099	11563	14007	17750	20607	15527	12566	12851	90
1946	10400	15827	64342	49622	22806	20996	12061	14172	16905	20385	16516	14719	16886	-41
1947	12080	12636	15558	12693	17944	19762	13837	10551	12954	19807	17099	13090	10735	-37
1948	9591	10116	8929	16919	16293	15234	25940	28424	21319	21221	17102	14651	12411	71
1949	12164	11816	13391	11149	11595	46259	12555	13873	16084	18165	13230	12325	11669	105
1950	9195	9448	9323	19648	34763	19884	18705	16798	20881	21072	16525	13292	12553	-87
1951	11576	44803	74388	61974	64148	27689	14857	18894	11728	21571	16785	14498	22993	158
1952	10983	14194	45591	73286	72272	55421	59008	59648	37918	18311	15033	22207	29058	-414
1953	16425	12994	42954	73082	22714	21298	15860	24900	24323	20036	15931	19620	18790	34
1954	13569	16697	13703	34199	61560	48970	39478	21465	13917	21623	16699	15267	18965	120
1955	12105	16277	22828	18684	14275	10987	13203	12284	15708	14571	9251	10993	10328	-12
1956	9192	11847	74151	75243	69123	34423	18534	38069	21763	18461	15433	16572	24221	-36
1957	14409	11908	10727	15403	35231	45596	20228	16150	17672	20572	15425	14168	14266	-206
1958	18075	14173	23112	38607	75248	73267	73556	43675	30451	18183	14669	21138	26586	-149
1959	17026	12127	11412	37511	53025	21267	9981	12841	18677	21326	16788	14676	14741	-13
1960	11940	9946	9383	11965	30110	21667	11092	12501	13107	19304	13682	9584	10450	77
1961	9116	11522	15712	11858	29930	18541	13367	11334	13044	19625	18109	13657	11145	-133
1962	11194	11122	16293	11221	45350	25843	11622	12653	18017	20991	16764	15102	12911	-69
1963	32980	16107	27058	15183	68182	33005	60206	35627	20412	16832	15815	14158	21237	84

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Year	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Annual Total (taf)	2020 minus 2001 (taf)
1964	14352	27698	12099	23022	14481	11232	18628	10892	13930	18546	17802	14741	11904	-280
1965	9927	13994	68168	74256	31523	23039	40952	22463	13494	20000	15698	14064	21021	22
1966	9983	21742	15646	29388	24316	26981	12880	14133	16532	20284	16108	13141	13325	109
1967	11854	14971	36848	41408	54099	53113	37213	43779	37153	15673	16414	21535	23073	-282
1968	17885	13489	15650	28516	60232	36295	14958	11054	14797	19526	16308	13252	15637	-30
1969	12498	12991	23826	74185	73884	46456	41779	46627	21547	16015	13417	18935	24100	-260
1970	16720	13525	56667	76416	71004	32983	14763	11325	15082	20992	15326	14704	21568	83
1971	10973	16893	60792	47159	27956	45967	21336	26038	20211	23016	16038	19373	20324	-69
1972	14379	12869	16676	17892	24877	35226	11775	11075	18209	20033	15750	11063	12647	33
1973	11033	18029	26320	73306	72975	51693	16311	17420	19816	19231	15398	12756	21218	47
1974	12063	61248	66989	74492	39761	73731	65746	22522	22114	17631	15602	21196	29745	-365
1975	16087	13649	16261	15276	64546	70775	20617	28160	22973	18095	15134	20221	19249	-6
1976	19277	16537	15949	13582	12389	14773	9520	7651	10647	15871	12204	11423	9658	-72
1977	7800	7669	7521	7907	7851	7573	8594	6049	11210	12621	11514	7120	6244	-93
1978	7763	7146	14736	64417	55187	61015	31748	20429	16986	17177	16460	15187	19714	44
1979	10380	10023	9446	22907	41602	30020	15644	16229	20456	19782	15180	12478	13419	-87
1980	11246	12973	19165	74158	74166	44310	17775	15775	15831	16289	15405	14192	19808	-183
1981	10308	9425	14381	21263	26565	29617	15726	11105	14140	19890	16954	12969	12180	295
1982	11787	32548	73771	69090	73784	68320	74431	35435	23291	16066	14961	16720	30641	146
1983	21769	36101	64330	71223	74897	77285	61547	56201	55396	24148	21365	26810	35542	-163
1984	19544	64442	75012	50559	33932	35331	17172	12640	14693	19980	16188	14318	22564	137
1985	10793	31739	21664	14056	15329	15376	11589	12999	13956	19614	17166	15339	12039	143

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Year	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Annual Total (taf)	2020 minus 2001 (taf)
1986	11266	10837	17300	25256	78396	74232	18144	12038	14471	14985	15745	14235	18290	-275
1987	11264	9353	10853	13719	19780	24685	13877	10353	14925	17022	13434	12209	10326	47
1988	10768	8626	17366	27663	16430	8656	10345	9721	11244	12069	8571	8034	9018	155
1989	7787	8967	9848	12525	8645	46898	21688	12847	14972	20151	17549	11799	11744	-64
1990	12777	11136	12673	19427	17079	12606	10931	6928	8740	11402	11070	8027	8602	-150
1991	7744	7223	6799	6725	7536	31776	12159	8962	8114	12408	9046	9467	7750	-2
1992	7636	7208	6631	10508	32971	19293	11278	10104	11078	11137	9252	9725	8754	93
1993	7735	7228	12508	58852	56889	42920	37854	28852	26350	18075	15983	12824	19544	83
1994	11858	10618	14556	14644	26883	13752	11422	8048	12250	21693	16697	16053	10714	-62
Avg.	11856	15083	24910	32906	39199	34038	24306	19445	17847	17733	14831	13731	15975	-22
Min.	7611	7094	6631	6725	7536	7431	7135	6049	8114	10284	7785	6993	6244	-414
Max.	32980	64442	75012	76416	78396	77285	74431	59648	55396	24148	21365	26810	35542	295

Table C-12. CALSIM-Simulated San Joaquin River Flows (cfs) at Vernalis for the 2001 No Action Conditions and Changes for 2020 No Action Conditions

Year	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Annual Total (taf)	2020 minus 2001 (taf)
1922	2192	1839	2745	2797	6645	7814	6928	7256	11880	2106	2004	1958	3369	-322
1923	3993	1821	4699	7244	6238	2993	6225	5264	2662	2088	1998	1909	2836	-86
1924	2099	1549	1659	1618	1850	1657	1724	1577	1223	1164	769	1060	1082	1
1925	1590	1486	1486	1279	2782	2575	4485	4053	2106	1762	1633	1658	1618	-2
1926	1892	1423	1500	1386	2001	1759	3524	3056	1537	1372	950	1208	1302	-1
1927	1647	1805	1982	1768	4613	3772	5682	5461	2292	1835	1667	1615	2049	-1
1928	1771	1916	2127	2179	2470	6009	5778	4745	1806	1614	1535	1533	2022	-249
1929	1832	1426	1480	1442	1810	1670	2386	2200	1314	1244	759	1081	1123	-1
1930	1364	1203	1182	1261	1589	1806	2404	2170	1265	1198	747	1065	1040	14
1931	1554	1203	1177	1155	1359	1250	1410	1181	1071	949	613	947	835	2
1932	1194	1234	3131	3437	7411	4580	4777	3937	1962	1743	1623	1647	2192	-3
1933	1891	1433	1430	1620	1923	2038	2491	2276	1161	1087	1057	1110	1176	0
1934	1316	1218	1329	1321	1862	1636	1693	1489	1053	963	685	938	932	4
1935	1124	1373	1456	3630	3290	3573	6403	5592	2957	2072	1767	1805	2110	-7
1936	1944	1525	1647	1866	9539	5746	7142	5346	2313	1930	1759	1808	2535	9
1937	2408	1588	1828	2563	14365	10717	9289	9483	2582	2078	1852	1900	3613	-349
1938	3275	1744	5616	6608	20023	27245	17508	21292	20717	3552	2216	2883	7954	-243
1939	9141	1882	2056	2029	3044	3863	4587	3980	1874	1788	1738	1558	2271	-102
1940	1976	1504	1532	4053	5755	9381	6707	5394	2631	2066	1984	1937	2702	-50
1941	2399	1812	2826	5308	14037	11106	10079	8839	6388	2409	2139	1987	4139	-42

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Year	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Annual Total (taf)	2020 minus 2001 (taf)
1942	4454	1949	5018	7658	9089	5864	6970	6445	5334	2768	2295	2172	3604	-61
1943	5778	2466	3609	12288	10718	17323	7837	7078	3091	2534	2227	2183	4648	-51
1944	3190	1971	2058	1990	3231	3397	5260	4759	2246	2162	2092	1847	2061	-72
1945	2147	1946	1945	1852	6644	7955	6959	5512	2692	2295	2209	1999	2648	-70
1946	3355	2066	5570	4711	5175	4528	5985	5254	2646	2193	2112	1955	2745	-120
1947	2248	1958	2199	1955	2766	1977	2524	2352	1659	1581	1173	1252	1423	-13
1948	1730	1462	1392	1239	1419	1828	3839	3541	2244	1789	1695	1687	1441	-4
1949	1848	1449	1427	1294	1676	2651	3613	3301	1784	1744	1672	1634	1455	-9
1950	1634	1416	1396	2009	2740	2415	3562	3200	1732	1591	1544	1599	1494	-3
1951	1674	3765	8809	10998	9758	5453	5557	5193	2468	1838	1709	1827	3546	-360
1952	2357	1779	2814	5536	6136	11660	9821	13209	13402	3260	2156	2567	4502	-60
1953	8433	1820	2498	6404	4901	3164	4752	4380	2346	1875	1786	1693	2659	-77
1954	2105	1578	1630	1684	2280	2630	4921	4300	1955	1905	1813	1693	1718	-21
1955	2009	1524	1625	1856	1967	1765	2503	2400	1676	1597	1191	1249	1288	1
1956	1516	1491	10510	16695	12011	6386	6031	5253	5446	2440	2066	2401	4340	-201
1957	4759	1626	1784	1759	2751	4253	4552	4462	2396	1838	1717	1682	2028	-75
1958	2205	1655	1748	1989	3428	8998	14464	12313	9947	2659	2263	2461	3866	-101
1959	7104	1718	1806	2045	4844	3205	4197	3211	1667	1615	1548	1542	2075	-80
1960	1818	1345	1330	1390	2160	1856	2511	2291	1484	1284	811	1141	1168	0
1961	1534	1295	1363	1214	1383	1275	1549	1346	1386	927	799	1130	916	-3
1962	1381	1235	1246	1194	5490	4534	4751	3905	1692	1563	1492	1552	1796	-8
1963	1833	1387	1362	1843	3255	2757	5868	5308	2954	2196	1848	1839	1952	-2

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Year	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Annual Total (taf)	2020 minus 2001 (taf)
1964	1975	1714	1736	1662	1665	1684	2433	2254	1400	1324	848	1172	1198	-1
1965	1715	1647	4076	9868	6905	4839	6957	5611	3103	2057	1802	1841	3032	-319
1966	2232	3103	5308	4817	4820	3474	4074	4204	1776	1732	1668	1592	2336	-52
1967	2096	1654	2875	3248	3187	6840	12538	13218	16210	9045	2071	3203	4599	-107
1968	6754	1679	2005	2055	4046	3280	4357	3283	1716	1672	1598	1561	2048	-43
1969	2000	1572	1933	13070	24214	18070	18504	23518	24612	4099	2122	2841	8158	-95
1970	8764	1852	3492	17016	9405	7442	5786	5312	2527	1977	1905	1909	4064	-61
1971	2308	1857	2413	2356	2677	3394	4520	4309	2242	1966	1872	1711	1908	-88
1972	2037	1552	1788	1716	1913	1708	2445	2607	1521	1472	1429	1441	1305	-3
1973	1848	1538	1585	2410	7358	8264	6734	5419	2236	1944	1850	1886	2580	-176
1974	2213	1650	2092	5581	4736	6375	7786	6179	3420	2279	2046	2067	2797	58
1975	3431	1864	2024	1967	6215	9082	7039	5879	4867	2380	2064	2086	2938	-83
1976	4053	1799	1903	1714	1946	1788	2452	2267	1466	1386	1379	1156	1408	-71
1977	3161	2097	1689	1299	1370	1274	1703	1582	1234	803	678	980	1079	2
1978	1474	1354	1527	3728	7845	9127	13012	11081	11289	2524	1852	2600	4042	21
1979	4607	1643	1820	5002	9345	8720	6459	5503	2210	1836	1747	1853	3041	-100
1980	2268	1795	1931	12474	21160	13146	7731	6122	5766	3919	1978	2853	4828	-112
1981	5008	1739	1878	2094	2573	3675	4448	3625	1718	1676	1612	1563	1910	-79
1982	2074	1705	1757	7409	13615	14963	24533	16144	9907	3752	2149	4196	6123	-123
1983	12788	7488	18300	23357	31183	37513	20253	19767	34681	17848	2007	6590	13929	-74
1984	12658	12583	20741	14414	9671	6198	5553	5158	2636	2204	2108	1948	5792	-42
1985	2287	1916	1965	1784	2198	2205	3266	3540	1725	1616	1538	1557	1544	2

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Year	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Annual Total (taf)	2020 minus 2001 (taf)
1986	2062	1694	1772	2183	16519	23623	12040	7756	6754	2376	2140	2149	4842	-151
1987	3449	1755	1791	1670	2031	1976	2481	2299	1534	1502	1263	1182	1384	-57
1988	1632	1330	1285	1279	1323	1256	1723	1593	1268	988	688	1032	928	1
1989	1529	1284	1390	1183	1360	1604	1751	1455	1276	1303	786	1152	969	-2
1990	1444	1321	1251	1190	1372	1323	1589	1332	1169	1069	717	1079	895	-1
1991	1282	1173	1130	991	1129	2395	2272	1725	1111	1074	766	1020	970	-7
1992	1228	1230	1132	1205	2201	1899	1956	1363	1113	1000	821	1079	974	-12
1993	1408	1347	1481	7413	5295	4562	4817	4638	3288	2098	1903	1790	2408	126
1994	3606	1558	1555	1355	1712	1496	2334	2199	1389	1375	916	1136	1246	-13
Avg.	2974	1896	2790	4132	5855	5894	5929	5405	4112	2205	1590	1794	2679	-61
Min.	1124	1173	1130	991	1129	1250	1410	1181	1053	803	613	938	835	-360
Max.	12788	12583	20741	23357	31183	37513	24533	23518	34681	17848	2295	6590	13929	126

Table C-13. CALSIM Simulated CVP San Luis Reservoir Storage (taf) for the 2001 No Action Conditions and Change in Carryover Storage for the 2020 No Action Conditions

Year	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	2020 minus 2001
1922	364	473	576	699	752	889	839	747	627	604	485	524	-13
1923	602	745	865	972	955	957	809	571	343	205	115	167	-31
1924	235	299	318	476	555	528	490	414	324	243	147	155	6
1925	160	202	346	546	785	782	789	669	484	334	338	394	-122
1926	448	532	537	748	864	880	809	721	529	311	135	143	-7
1927	90	257	412	633	819	911	809	615	420	264	152	183	-1
1928	262	406	528	686	803	944	897	655	348	180	72	135	6
1929	185	320	491	646	716	681	613	494	356	197	111	100	3
1930	140	120	360	614	753	921	871	707	512	282	193	206	-71
1931	251	358	365	551	600	572	532	454	361	239	111	107	-12
1932	101	129	303	598	811	887	861	795	705	613	706	883	-72
1933	972	972	972	972	972	929	885	803	684	553	450	486	-12
1934	556	571	797	972	972	942	888	790	641	468	310	285	18
1935	249	392	536	822	876	925	890	794	715	497	505	563	-8
1936	599	634	751	949	949	933	835	697	478	291	231	287	29
1937	371	397	477	668	815	921	934	910	765	529	509	609	-4
1938	706	865	939	972	967	972	898	760	662	790	674	844	-4
1939	921	972	931	972	972	972	852	651	452	265	135	126	16
1940	90	131	228	454	581	711	726	592	384	208	125	162	13
1941	267	372	509	691	845	935	789	662	557	550	464	495	58
1942	575	719	853	972	955	970	861	683	583	556	435	520	-23

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Year	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	2020 minus 2001
1943	596	737	856	972	955	972	861	728	470	287	172	201	0
1944	310	430	494	650	749	850	766	605	390	251	135	180	24
1945	166	320	454	646	794	886	744	519	347	183	98	135	0
1946	267	413	635	799	809	876	831	664	403	181	45	67	11
1947	162	324	439	647	744	856	789	585	332	213	135	180	4
1948	135	197	263	462	705	789	793	575	376	226	150	187	-42
1949	272	396	556	666	715	885	797	617	400	295	135	160	12
1950	195	324	379	586	671	795	688	514	359	296	279	355	21
1951	391	552	712	921	955	967	817	578	271	107	45	96	2
1952	176	324	446	620	749	847	827	736	646	558	401	593	87
1953	671	868	972	972	972	915	859	627	389	242	113	146	11
1954	222	362	529	678	779	877	843	589	334	125	45	109	39
1955	151	313	473	614	657	686	628	500	384	183	135	165	-30
1956	166	324	480	746	912	972	958	805	675	602	479	547	-6
1957	624	817	972	972	972	972	934	737	446	229	129	193	-45
1958	263	433	543	679	750	846	824	731	641	561	398	610	59
1959	688	881	972	972	972	971	879	688	391	127	45	94	21
1960	135	160	147	289	371	512	424	276	110	128	135	135	0
1961	197	327	456	631	796	911	814	579	288	150	71	128	3
1962	135	192	312	461	580	691	625	419	241	115	46	158	-2
1963	239	384	508	667	801	909	899	651	431	243	109	160	31
1964	235	374	540	687	715	717	677	480	319	138	117	150	10

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Year	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	2020 minus 2001
1965	135	279	505	701	834	971	972	777	474	227	49	72	46
1966	158	292	449	599	695	779	658	446	270	140	75	135	7
1967	159	319	444	621	748	845	786	667	599	594	494	529	0
1968	611	822	972	972	972	972	906	702	388	193	45	135	0
1969	162	324	435	593	703	875	852	757	659	801	814	972	-203
1970	972	972	931	972	972	972	903	655	353	45	45	72	37
1971	162	303	472	626	809	917	888	701	424	208	53	69	-7
1972	149	327	464	605	704	816	728	505	316	216	135	147	-12
1973	212	359	487	670	800	894	793	613	433	279	181	213	-11
1974	294	438	562	738	832	923	796	584	397	368	262	294	-58
1975	375	556	681	841	972	972	864	659	415	349	230	367	-29
1976	444	586	704	856	848	913	877	781	602	407	282	293	-76
1977	286	303	303	405	394	360	313	226	137	90	90	117	1
1978	189	233	403	694	853	972	898	748	626	538	399	427	65
1979	566	704	840	972	972	972	937	727	462	316	153	184	-30
1980	258	360	475	637	779	972	972	822	657	697	577	622	50
1981	724	849	938	972	972	972	910	662	383	178	56	135	0
1982	136	272	385	544	633	761	751	673	603	632	542	740	-1
1983	822	972	956	972	955	972	898	761	664	625	651	744	-10
1984	963	972	972	972	972	972	938	719	413	147	45	70	-9
1985	145	283	447	630	689	727	596	385	172	46	45	108	-8
1986	135	188	320	508	652	824	765	650	550	323	232	271	-1

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Year	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	2020 minus 2001
1987	396	543	722	889	972	972	917	775	568	329	135	135	0
1988	122	209	325	512	709	655	621	537	360	187	90	90	0
1989	114	162	276	445	456	651	635	456	267	179	135	135	0
1990	165	283	474	695	809	872	813	730	580	425	318	298	-44
1991	320	327	394	459	461	614	558	457	357	230	123	249	-42
1992	308	310	388	521	753	868	786	694	489	210	90	90	0
1993	194	250	404	667	810	879	752	644	545	452	344	373	112
1994	453	597	671	830	972	970	822	586	262	66	45	90	0
Avg.	338	448	562	713	796	859	795	637	452	317	227	278	-3
Min.	90	120	147	289	371	360	313	226	110	45	45	67	-203
Max.	972	972	972	972	972	972	972	910	765	801	814	972	112

Table C-14. CALSIM Simulated SWP San Luis Reservoir Storage (taf) for the 2001 No Action Conditions and Change in Carryover Storage for the 2020 No Action Conditions

Year	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	2020 minus 2001
1922	165	92	135	462	756	913	799	680	692	294	281	490	-259
1923	576	661	730	937	919	888	770	556	366	221	165	204	-47
1924	165	66	162	370	495	421	339	249	171	134	110	110	0
1925	184	250	347	514	719	626	670	659	593	477	689	808	-116
1926	860	813	824	920	956	861	825	603	408	244	165	133	7
1927	117	286	341	694	935	979	879	740	682	322	268	376	-124
1928	315	471	674	953	1067	1067	974	687	541	191	165	159	-3
1929	140	126	163	387	507	516	458	367	334	211	113	110	23
1930	110	110	314	533	584	631	478	275	228	174	165	394	30
1931	235	140	70	216	230	193	105	55	55	125	110	113	-3
1932	143	137	329	566	755	742	616	584	565	381	613	680	-50
1933	708	793	812	1053	940	1007	926	846	703	544	467	410	-107
1934	421	339	503	702	836	774	637	476	331	125	110	110	0
1935	110	171	221	470	599	880	773	389	312	237	160	137	-3
1936	105	55	55	340	729	934	786	535	426	231	180	165	149
1937	118	55	55	229	607	897	749	607	256	154	145	173	95
1938	150	299	314	665	872	917	779	612	678	277	235	608	-115
1939	798	947	1067	1067	1020	1003	737	505	233	165	128	110	0
1940	110	55	55	259	664	785	672	466	274	238	182	305	-223
1941	142	55	232	597	890	1067	1013	945	793	463	452	582	-60
1942	795	954	1067	1067	937	981	879	748	735	328	272	497	-45

Table C-14. Continued

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Year	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	2020 minus 2001
1943	673	833	1059	1067	1067	1067	938	754	655	352	307	364	42
1944	366	236	226	485	609	688	523	292	134	64	55	152	3
1945	132	277	308	527	883	958	777	541	335	322	269	164	103
1946	157	237	297	618	497	620	468	263	150	94	71	134	23
1947	140	124	164	297	513	654	518	240	56	76	129	110	0
1948	110	110	61	288	229	347	411	258	222	184	158	128	131
1949	130	60	66	199	286	492	431	355	394	277	323	411	-41
1950	362	300	265	497	810	883	723	489	412	361	332	372	11
1951	400	544	589	923	970	1015	844	636	344	222	162	165	0
1952	165	192	397	761	1066	1067	1067	884	968	828	812	887	-204
1953	1067	1067	1067	970	947	1011	852	683	653	362	307	341	-24
1954	439	581	676	948	1067	1067	963	652	408	240	165	137	1
1955	125	187	370	737	719	719	644	582	537	427	248	279	80
1956	256	364	529	673	769	814	673	515	596	276	221	433	-55
1957	603	540	481	758	971	1066	951	764	571	370	183	162	99
1958	339	429	477	794	935	980	824	679	780	494	386	552	-130
1959	730	723	825	1067	937	764	586	358	215	165	132	59	53
1960	110	55	55	187	397	601	460	383	360	345	271	333	59
1961	298	343	475	618	886	867	715	428	258	133	126	106	4
1962	110	108	170	270	678	918	744	409	271	137	95	110	-3
1963	255	401	431	723	939	1016	898	737	694	320	263	323	-80
1964	481	633	662	940	831	735	593	300	71	55	55	103	18

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Year	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	2020 minus 2001
1965	110	166	235	597	862	922	818	633	491	241	223	387	-2
1966	304	482	743	1066	975	1026	795	566	363	232	165	74	73
1967	86	204	290	653	923	971	796	630	700	654	645	948	-96
1968	1067	1067	1067	1067	1067	1067	926	687	391	180	140	86	44
1969	127	119	161	570	896	978	962	913	997	673	370	493	193
1970	690	866	1067	1067	1067	1067	913	666	480	205	165	142	-74
1971	130	278	482	747	549	748	614	448	348	241	191	164	-109
1972	257	250	242	522	675	882	740	546	417	271	312	289	26
1973	299	492	569	886	998	1043	919	737	667	408	351	288	65
1974	342	495	533	873	970	1015	876	708	764	394	344	353	11
1975	523	603	802	1064	1067	913	796	653	563	238	180	410	-34
1976	574	722	919	1067	994	945	781	554	310	165	156	119	2
1977	110	83	55	110	108	107	61	55	123	114	110	126	25
1978	125	147	345	603	895	1067	895	869	899	509	522	684	-182
1979	720	625	473	838	881	983	860	679	485	326	251	179	13
1980	167	188	233	619	918	1067	1018	892	852	495	496	635	-232
1981	733	625	698	998	905	984	831	541	286	165	151	62	42
1982	95	246	283	632	905	979	836	691	721	331	289	596	-110
1983	781	946	1067	1067	1067	1067	1067	1067	1067	1067	1067	1067	0
1984	1067	1067	1059	1067	1067	1067	949	734	458	231	133	165	-36
1985	227	374	570	712	719	676	414	158	55	55	55	55	4
1986	55	55	55	309	660	891	805	614	578	265	252	507	23

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